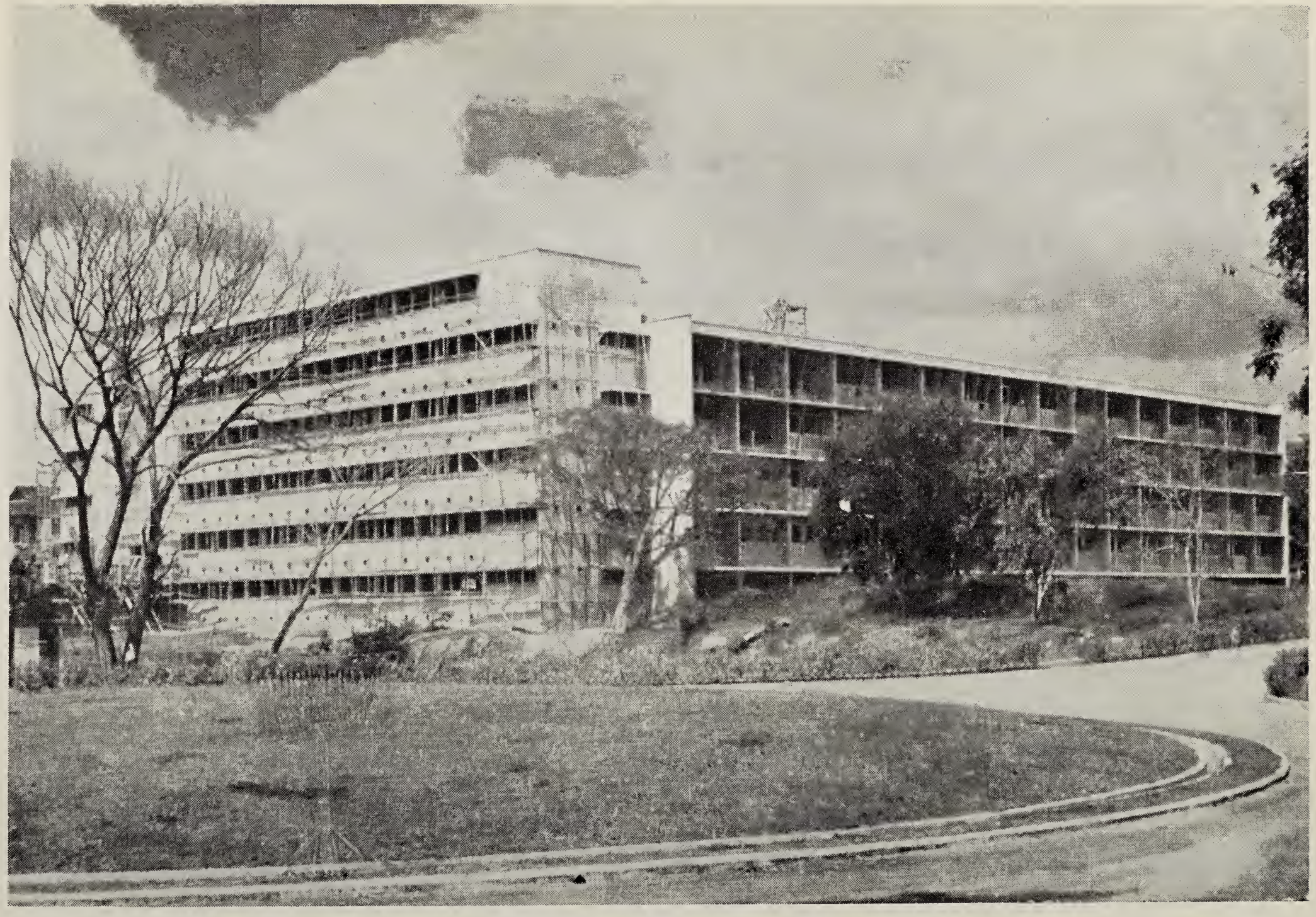
COLONY OF SINGAPORE

ANNUAL REPORT OF THE MEDICAL DEPARTMENT 1952



General Hospital—New Nurses Home in course of construction

COLONY OF SINGAPORE

MEDICAL DEPARTMENT ANNUAL REPORT 1952

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GENERAL

CHAPTER ONE

INTRODUCTORY AND ADMINISTRATIVE

THE YEAR 1952 created another health record for the Colony in that the infant mortality rate dropped to under the 70 per 1,000 mark for the first time in its history and the general death rate to 11.20, both all time records. In fact the infant mortality rate for rural Singapore with its 306,000 population reached a low level of 55.9. At the same time the population continued its rapid increase and the birth rate remained at its exceptionally high level of 47 per 1,000.

———	1939	1944	1947	1950	1952
Infant Mortality Rate ..	130.43	285	87.3	82.2	69.97
Death Rate	21	51	13.3	12.1	11.20
Population	727,564	860,000 (approx.)	938,144 (census)	1,015,453	1,077,155
Birth Rate	45	37 (approx.)	46	46	47.53

No epidemic manifestations occurred and malaria remained practically non-existent apart from minor explosions due to careless building expansion exposing dangerous mosquito breeding or interfering with existing anti-malarial measures and imported infected labour. The malaria-free situation is remarkable in such a highly malarious area as this and the malaria-ridden state of the people in 1945 after the enemy occupation.

Exception has been taken in one recent report in the British Press to an infant mortality rate of 75.15 in 1950/51 and a comparison has been made to the England and Wales figure of 30 from the Report of the Ministry of Health for 1951. This is a most unfair and unwarranted comparison since it fails to take into consideration the local situation in this respect or the history of the infant mortality rate in either territory. Here there is a population which consists of several different entities which respond to a propaganda approach in distinct ways and in which a large section of each still adheres to native forms of medicine. Many families continue to inhabit small and ill-ventilated one-roomed cubicles, with several of them on one floor. The infant mortality rate in Singapore was as high as 250 in the 1920's when that in England and Wales had dropped to the 70's. It took up to the 1930's to reach the 60's and the 1940's to reach the 50's in that country. Belgium and Italy still hover round the 60's, and large congested port areas even in Europe today are behind Singapore in this respect.

The significant feature in Singapore is the rapidly increasing preponderance of young men and women in the population due to the considerable natural increase over the last decade which must lead to a continued very high birth rate concentrated in an overcrowded, cubicle type of accommodation for some decades to come, however rapid the improvement in housing is. Thus it is remarkable that neither the infant mortality rate nor even the death rate is higher than it is. It is impossible to develop domiciliary midwifery as it is understood in Great Britain under such conditions. Thus more hospitalisation and more clinic control is the only real advance that can be hoped for here. This means a steady progress on the scheme which has been developed so successfully so far.

The table on page 31 indicates the remarkable drop in the death rate which has occurred over recent years as compared to any previous decade. Such very important conditions as malaria and unspecified fever, pregnancy and childbirth, premature birth and diseases of infancy, and pulmonary tuberculosis record a steady and continuous fall over the post-war decade. Others, and in particular conditions associated with the digestive system, while well below the pre-war average, appear to have reached a somewhat stationary level. What is surprising here is that such conditions are not far more prevalent in view of the many overcrowded cubicle dwellings which persist with most primitive kitchens and sanitary arrangements, the many squatter areas, and the thousands of hawkers to be met with in Singapore. We can congratulate ourselves that outbreaks of enteric and dysentery have been so infrequent and on such a diminutive scale, so far, under these conditions. There has been an apparent increase in cancer, and heart and circulatory conditions; while better diagnosis probably plays its part in this connection, a study of what statistics of malignant diseases are available over the pre-war period seems to indicate that the present situation corresponds. What is important is that treatment and diagnosis facilities are incomparably better.

Maternal mortality has fallen from a figure of 4.0 (rate per 1,000 live births) in 1939 (over 7.0 in 1945) to 1.8 where it appears to hover at present. The remarks made above indicate sufficiently the reason for this.

Diphtheria and tuberculous meningitis continue to cause difficulty and to seriously affect the infant mortality and child mortality rates although fatalities from these causes showed some improvement. Mothers continue to ignore the *second* inoculation which is absolutely essential for diphtheria immunisation, in spite of an intensified propaganda campaign. It will take quite a time before we reach the happy position in respect of this disease reflected in the United Kingdom after years of successful instruction. Children suffering from tuberculous meningitis apparently do not respond so satisfactorily here to antibiotics and in addition many of them do not reach us till they are moribund.

Keratomalacia has also become a factor of some importance in that this condition can cause blindness in early age. It would appear to be primarily concerned with unsatisfactory home conditions and with neglect and ignorance. Cases are not many in actual numbers but the condition stresses the importance of a complete ante and post-natal service combined with domiciliary attention.

One of the most successful *voluntary* vaccination campaigns ever carried out in an eastern community was completed during the latter part of the year, over 70 per cent of the entire population being immunised. In consequence, even if small-pox is introduced into Singapore it should do little damage today and be no cause for alarm.

Acute anterior poliomyelitis continued its mild endemic nature with an average of about 5 cases per month for the year but without any epidemic manifestation. So far this disease has shown three explosive outbreaks at some 30-month intervals over the post-war period, and so 1953 may well expect to see a recrudescence of this unhappy and disastrous complaint. Everything possible has been done to prepare for such an occurrence, however, and a scheme for the prolonged treatment necessary has been followed by building up the physiotherapy section of the new orthopædic unit, by providing more beds and by organizing a battery of 14 iron lungs.

The rural health scheme outlined as a part of the Medical Plan was reviewed and modified during the year owing to the increased cost of the original plan. The idea now is to divide the Rural Area with its 306,000 people into seven divisions with a main rural health centre in each from which will radiate subsidiary nurse and midwife centres up to a total of 100 which will

fully cover all necessary activities throughout the rural districts of the Colony. The main centres will be true health centres in the fullest sense of the term, staffed by a full-time doctor and sisters, nurses, midwives, dispensers, hospital assistants and anti-malarial staffs concentrated in each. So far three such centres have been organized with 38 subsidiary centres. In 1953, 2 more main centres will be developed with 12 more subsidiary centres in 1954. As it is, over 60 per cent of all rural births were actually attended in 1952, and all other rural births were observed as soon after birth as possible. Abnormal and difficult cases are sent to the Maternity Hospital in the City which now deals with over 30 per cent of all Colony births.

As the Director of Medical Services expected to retire during 1952 a special effort was made to supply a Medical Report for 1951 on the fullest and most exhaustive basis. This outlined in detail the Medical and Health organization of the Colony and the plan to double all the existing services during the immediate future. In consequence, this Report is a shorter edition which merely aims at stressing the most important happenings in this connection during the year 1952, and at bringing the very comprehensive 1951 survey up-to-date. This Report must be read in this light and with the 1951 review in mind.

The Ten Year Medical Plan was designed in 1946/1947 to modernise the existing institutions and service, and to double all these with new buildings and staff. It was accepted officially by a social-service minded Legislative Council in 1948, but a bottleneck in building has meant that its implementation only really got going in 1951. Steady and satisfactory progress should now, however, be attained and continued. What *is* lost sight of so often is the fact that new staff and particularly nursing staff—cannot be retained let alone recruited unless proper accommodation and training facilities and first class amenities exist. Thus the importance of the near completion of the new Nurses Home for 250 probationers at the General Hospital and the completion of two of the several rural health centres required cannot be over-emphasised.

No modern out-patients divisions ever existed here until the completion of Rotary's effort at the Tan Tock Seng T.B. Hospital in 1949. So the new and modern out-patients division at the General Hospital now nearing completion should be a matter of real satisfaction to the public of the Colony. When this and the one to be started for the Kandang Kerbau Women's Diseases Institution in 1953 have gone into operation we will be in a position at long last to organize our out-patients service to the public on a more satisfactory basis and so attempt to save beds for the acutely ill. The Almoner's service which has been built up steadily since 1949 will then be in a position to supply this modern essential to any medical organization in the way for which the service has been designed.

That out-patient attendances at the hospital clinics have increased to some 700,000 per annum from a mere 90,000 before the war and have been dealt with in the same cramped and outmoded accommodation is a real tribute to an overworked and willing staff. Complaints of delay in attention and in treatment must be inevitable under such conditions. Not until the end of 1951 was it possible to organize an observation bed unit for the existing out-patient division, so great was the pressure on the accommodation available for admissions and for staff accommodation of one sort or another. And of course until 1951 there was such a very acute shortage of staff that the greatest difficulty was experienced in maintaining any reasonable service.

The year has seen particularly a steady development in the *radiological* and *orthopædic* services, and in the reorganization of the *Venereal Disease* service. There is still an additional deep X-ray therapy set to be delivered and when this arrives the X-ray division should be sufficient to cover the present demands on it for some time to come. By the end of the year the

set at the Tan Tock Seng (T.B.) Hospital was doubled in capacity and new sets were being installed at the maternity and mental hospitals. It was no good talking about doing this before because there was not the staff to do it until comparatively recently. While malignant disease is dealt with at the General Hospital in the beds of the various units, a few beds were made available there for use for cases from the Women's Diseases wards at Kandang Kerbau. When the expansion envisaged at the General Hospital for 1953 has been sufficiently advanced a separate bedded unit for the combined radiological and radium treatment of malignant disease will be established.

The orthopædic unit at the General Hospital was started in March and so great has been the demand for this sort of treatment that the new unit is working under extreme pressure already. Co-ordinated with this unit is a physiotherapy and an almoner division plus beds at a separate Children's Orthopædic unit, crippled children's unit and a post-polio unit.

The V.D. scheme can now be said to be one of the best of its kind anywhere and it has been so described by a visiting W.H.O. expert. Apart from a 70-bedded hospital and clinics, the unit comprises a dock and seamen's clinic, a follow-up scheme staffed by specially trained female supervisors and a travelling rural dispensary-treatment section. It is doubtful if gonorrhœa will ever decrease in quantity whatever is done, particularly as it is so easily cleared up in the majority of cases, but syphilis as a disease seems to be on a definite decline. Other venereal conditions are conspicuous by their absence. The increasing number of people attending on suspicion of having contracted the disease without this being so is a further hopeful sign of confidence in the service provided.

Three very important conditions present increasingly difficult problems although each is being vigorously tackled. These are tuberculosis, leprosy and mental disease.

The Government tuberculosis service now deals with a yearly average of some 1,700 in-patients, and some 4,300 out-patients at the T.B. centre at Tan Tock Seng Hospital. Some 14,000 patients have passed through this institution alone since its inception in 1946. The service has been steadily expanded since then but lack of sufficient beds is the chronic difficulty. With the beds in constant use for this disease at the General and Children's Orthopædic Hospitals added, over 500 are now in constant use for this condition. Even so over 1,000 patients are waiting on the admission registers and no doubt many more could be found without undue difficulty. While the death rate from tuberculosis has fallen year by year until it is now only 39 per cent of the pre-war rate and while it is a fair assumption that the Chinese population offers good resistance to it, there is no question that thousands of cases exist in the overcrowded city although most of the estimates given are thought to be grossly exaggerated. Between 1 and 2 per cent of the population is considered to be a fair estimate. Present work is concentrated on treatable cases with a possibility of opening up community centres for the non-treatable chronic and the destitute. The question of a special chest surgery unit is under consideration: at the moment such cases are dealt with at the General Hospital. B.C.G. work is concentrated on school children and on specially susceptible groups, as advised by Professor Frederick Heaf, Adviser on Tuberculosis to the Colonial Office and to the Ministry of Health. Of these groups 81,111 individuals have been tested up-to-date, 23,126 being B.C.G'ed. The tuberculosis problem raises the question of the chronic sick in an acute form and stresses the importance of providing separate accommodation for the many persons for whom little but provision of accommodation and the minimum of treatment are necessary. Many precious beds in our present hard-pressed hospitals could then be made available for those for whom something is really possible in the way of treatment and care. The inauguration of a scheme

by voluntary aid for this purpose during the year is considered a step forward in the right direction and one to be fully encouraged. Professor Heaf during his visit gave particular attention to this aspect of tuberculosis and the need for community help in connection therewith.

Leprosy patients have increased from some 200 pre-war to some 1,500. While the enemy occupation may well have led to an increase in this condition there is no doubt that the form of the present institution and its treatment and amenities and the increasing medical and health services offered have led to many sufferers previously in hiding coming forward. The present average yearly increase is in the region of 90. There has been a steady improvement in the number of patients becoming or proving non-infective and 506 now attend as out-patients but it is feared that many will have to remain in the Settlement. The number of early cases coming forward has, however, been an encouraging sign. That the condition is being so well controlled in Singapore is the important factor.

Mental disease is becoming a really pressing problem in that an increase of some 150 yearly seems to be the present position although the discharge rate here of 59 per cent of direct admissions compares favourably with figures elsewhere. Some 1,700 inmates were under treatment by the end of the year. There must be a limit to the number of such cases any community can absorb. More out-patient clinics have been suggested as a solution: a majority of cases seen seems to warrant institutional treatment unfortunately—for a time, in any case.

The lack of sufficient hospital beds is becoming a pressing problem. The Medical Plan seeks to double the present facilities in all medical fields and will take us quite a long way on that road to an adequate service for all so ardently desired by so many of the community. So perhaps it is not out of place to reiterate our aims in this direction. Briefly the Medical Plan seeks:—

(*a*) the modernisation and improvement and enlargement of all the existing hospitals;

(*b*) the building of a new hospital centre which will include a general hospital block, a children's block and a women's diseases block. (This scheme is being redesigned with a concentration on existing sites as an economy measure. The scope of the present scheme will remain fully in being however.);

(*c*) the improvement and expansion of Tan Tock Seng Hospital to an 800-bedded tuberculosis centre, with a chest surgery unit, and the building of a tuberculosis sanatorium hospital with 300 beds for the more chronic cases. (This scheme is being re-designed also.);

(*d*) an expansion of the Venereal Disease Hospital cum Out-patient cum Dispensary scheme;

(*e*) a really modern settlement for persons suffering from leprosy;

(*f*) a modernisation of our mental institutional treatment with special facilities for mental defectives;

(*g*) a chain of really attractive child and maternity clinics throughout rural Singapore; the more important of these to be combined with static dispensaries, and to form rural health centres in the fullest sense of that word;

(*h*) a modern quarantine and dangerous infectious diseases station;

(*i*) a first class school medical and dental clinic service with mobile units forming a chain linking it to all the schools in the Colony.

All this will be welded into a workable whole so that eventually the health of every section of the population will be sufficiently catered for. With the best will in the world this cannot be done under existing conditions and the fact cannot be ignored.

It is interesting to record that the Base Medical Stores and Manufactory adjacent to the General Hospital, which was only completed in 1951, has proved its worth already, and will soon have paid for its capital cost through its provision of medicinal preparations its machinery has been able to accomplish.

A concentrated effort will be made in 1953 on modernising and bringing the General and Kandang Kerbau Hospitals up to 1,000 and 350 beds respectively. During the year the plans to achieve these objects were fully clarified in consequence. The former is the only institution available for acute general medical and surgical cases: the latter the only institution for maternity and women's diseases. While the admissions to the former have been doubled over the post-war decade and reached a record figure of 23,421 cases through its 750/800 beds during the year under review, the latter dealt with over 20,000 admissions in its 240 beds, over 17,000 maternity cases passing through 200 beds. This must surely be a world record. These figures speak for themselves and for the urgent necessity for the Medical Plan. Apart from the fact that the population has increased by some 40 per cent over that pre-war, a large majority of the people prior to the occupation never wanted nor attempted to seek Western medicine. Today the large majority expects—and rightly—the most modern forms of accommodation and treatment that we can provide. In consequence the Medical Directorate has been faced with providing a satisfactory service for well over twice the numbers the existing hospitals and clinics were designed for, and in the maternity field, several times that number. So far this demand has been met—and successfully—by giving as much essential attention to as many as possible instead of providing a first class service which can only be extended to a far lesser number—but of course there is a limit to expansion on these lines.

A study of the Hospital section of this Report will indicate that by the end of the year our medical institutions were dealing with over twice the amount of in-patient—and many times the out-patient—work covered before the war in spite of use of wards for accommodation for nurses and housemen. This has and will continue to lead to overcrowding of wards and clinics. The limiting factor to more and yet more beds in the hospitals for acute cases will be the nursing strength available, and that is why so much is hoped for from the new Nurses Home.

Criticism has been levelled at the creation of an orthopædic unit until the two general surgical units could be increased to three. It is not generally realised that orthopædic work has always occupied a third of the time and beds of the old surgical units: that the Professor of Surgery estimates that the existing general units are now doing twice the work of the pre-war units. In addition a good deal more major surgery is being accomplished.

Prematurity has received recent attention in that the existing hospital for the purpose does not contain the special nursing and equipment which are a feature of colder climates. While the most up to date requirements are included in the new units to be built next year it must be emphasised that a past Professor of Midwifery with over 20 years' experience in Singapore pointed out the errors which can arise by lack of due consideration of local factors. Far, far more is being done in this respect than ever before by recovering large numbers of premature infants from a deplorable environment and giving essential attention. It is thought that figures of local prematurity are very exaggerated in that these are based on European weight standards which are known to be different to Asian standards and that the local still birth rate is well below that of England and Wales. (15.4 for Singapore in 1952 and 22.6 for England and Wales in 1950). Infants which barely survive to take one breath are classed as premature births. Numbers of infants are still—distressing though it is to admit—subject to eastern and outmoded forms of treatment.

The present aim is to get as many infants away from the cubicles and the hands of the inexpert, even if this means overcrowding cases in more sanitary surroundings for the moment.

Lack of sufficient doctors and nurses over the post-war period has been as acute a problem as lack of accommodation. While medical staffing is being rapidly relieved by the present rate at which graduates are coming out of the local Medical School, sufficient trained nurses will not be forthcoming for a long period in spite of the recent improved recruitment, unfortunately. While no doubt proper and sufficient accommodation and amenities will improve this further, *every* source must continue to be tapped and to be explored. There is a serious local prejudice on the part of the parents of girls of the right age and educational standing taking up nursing, which will take time to overcome, quite apart from the girls themselves being attracted to such a career. An assistant nurses scheme is, however, in operation under which girls of a lower educational standard may be recruited; this may be the best way of bringing in girls from vernacular schools as well, but this is being further explored. One of the real present difficulties continues to be lack of sufficient *experienced* personnel. Only time can cure this without recruitment from outside the Colony. In consequence, a small overseas recruitment, particularly in the nursing field, must continue to supplement the shortage, on a short term basis as far as specialists in various directions are concerned. Both the local medical and nursing qualifications are registrable now in the United Kingdom and these standards *must* be maintained in such a concentrated and highly urbanised population centre as that of the Colony of Singapore. These are difficult enough to obtain and preserve: easy enough to relax. Assistant nurses and midwives must be trained to a reasonable minimum standard or they become little, if any better, than amahs and a serious menace not only to the institution in which they work but to the public at large. By adhering to these standards we attempt to set an example to South-East Asia in these respects.

Midwifery training received encouragement by the appointment of a tutor adviser seconded by the World Health Organization from the Central Midwives Board in London. This lady arrived while the present Ordinance and Regulations which control our midwives and their training were being completely revised. Thus her experience was used in this essential direction. While every effort will now be made to develop a domiciliary training scheme in addition to that provided by the rural service and to seek eventual reciprocity with the United Kingdom in the nurse-midwife field, a lower category of midwife must unfortunately continue to function in this country and in particular to provide the rural districts with Malay midwives. The new and expanded maternity hospital will play its vital part in these respects. The idea is to eventually provide the rural and city areas with sufficient midwives to run a complete public service in this field.

As the Medical School is now part of the University of Malaya, the report on its activities as such is omitted from this brief review. The University issues its own report which includes that of the Medical Faculty. Suffice it to say here that the financial aid system to students was continued. With regard to new students the Singapore Government awarded six new bursaries during the year—to five medical students and to one dental student.

The following shows the number of students in the different years:—

	Medical	*Dental*	*Pharmacy*
First year	70	8	5
Second year	52	24	15
Third year	60	14	—
Fourth year	54	24	—
Fifth year	43	17	—
Sixth year	86	—	—

Seventy-six new students were admitted to the Medical Faculty at the beginning of the academic year of 1952 (68 medical, 4 dental and 4 pharmacy). The admission of a substantially larger number yearly than in pre-war days has raised many difficult problems concerned with hostel accommodation, teaching staff and hospital facilities. It is frequently overlooked that more or less the same medical organization has attempted to absorb three times the pre-war number of students.

Final professional examinations were held in June and December, 40 students qualifying in medicine and 15 in dental surgery. To achieve a yearly figure of 50 graduates means that an average of over 65 students have to be forthcoming every year, to meet the 20 per cent wastage suggested by the Carr-Saunders Report. It will be noted that this figure has only been approached comparatively recently.

The new Medical Act was in course of preparation towards the end of the year as the full implications of the new legislation in the United Kingdom in this connection came to be studied. The United Kingdom has made a housemen's scheme an essential of registration and it is certain that all newly qualified personnel here will have to follow suit if reciprocity in registration is to be retained. This procedure can but be of benefit to public and doctor alike.

The number of doctors, dentists and pharmacists as at 1st January, 1953, in the Colony was as follows:—

	Doctors	*Dentists*	*Pharmacists*
Private Practitioners ...	209	29 (qualified) 259 (unqualified	68
Government	109	14 (qualified)	5
Housemen	26	—	—
University	27	7* (qualified)	2
City Council	10	—	—

The following figures give some idea of those who have gone or are going overseas for study over the post-war decade:—

Returned from study courses overseas	16
Now on study courses overseas	21
Courses being finalised	8

The nutritional state of the people continued to receive due attention and the Nutrition Council continued to meet from time to time to study any aspects of this problem necessitating attention. The Council sought to implement its policy that an adequate diet should be available to all people in the Colony. In order to increase the nutritive value of the diet the recommendation was made that Government should consider a policy of enrichment of rice and other staples which could be put into effect immediately should a deterioration in health be observed. It was considered that the scope of the child feeding scheme should be enlarged to cover the needs of all children in the Colony who require such assistance. An alteration in the dietary patterns is necessary in order to make the best use of available foodstuffs and the Council considered that education was an important factor in bringing about this change. With this in mind the Council is investigating the requirements for training in nutrition at various levels for public health workers.

The Division of Applied Nutrition, University of Malaya, made use of the records of the maternity hospital for a study of the effect of the age and the parity of the mother on the birth weight of the offspring. It was found that the birth weight increases with parity and that the difference is significant.

Note:—Of the non-Government doctors, 7 are employed in missions.
* 4 temporary special registration.

The effect of age is much less and of doubtful significance. However the two factors together account for only a small proportion of the observed variation in the birth weights of infants.

The growth study of the first year of life of 250 Chinese and Southern Indian infants living in the urban area of Singapore was completed. The gains in weight and length will be analysed in relation to the feeding, the medical history and the external environment of the infant. The records of Government Welfare Clinics have been collected for comparison with the weights obtained for the study groups. These infants will be kept under observation as part of a study of the progress of pre-school children.

The Division co-operated with the staff of the Eye Clinic, General Hospital, in the investigation of a number of families in the urban and rural areas. The object of these inquiries is to ascertain the major causes of keratomalacia in infants.

There is no doubt that the general nutritional state continues to be satisfactory—a fact which is borne out by the results of examination of school children which showed that less than ten per cent could be described as of poor quality.

The Chapters on Voluntary Aid and Occupational Help in the 1951 Report gave such a complete picture of the present position in these respects that these have been omitted in this year's review. Voluntary assistance to the Medical Services by the following societies and groups of citizens continued on an ever increasing tempo however and is gratefully recorded:—

> The Ladies Diversional Therapy Unit, the Leprosy Welfare Committee, the Rotary Club of Singapore, the Singapore Anti-Tuberculosis Association, the Tuberculosis Treatment Allowance Advisory Committee, the Blood Transfusion Committee, the St. John Ambulance Association and Brigade, the Singapore Branch of the British Red Cross Society, the St. Andrew's Mission Hospital for Children and the Singapore Association for the Blind.

The foundation stone of a crippled children's home of 40 beds was laid by His Excellency the Governor on 8th July, 1952. This project has been sponsored by the Singapore Branch of the British Red Cross Society from money contributed from all races. In December the Rotary Club of Singapore started work on a community centre and school for the Leprosy Settlement. This is the second medical scheme sponsored by Rotary, the first being the Tuberculosis Clinic at Tan Tock Seng Hospital in 1949.

The Kwong Wai Siu Chinese Free Hospital added 58 maternity beds to its existing 350—an outstanding and important addition to our present bed strength. A Tuberculosis Home Association was formed to furnish assistance to chronic and destitute persons suffering from tuberculosis with nowhere to go—a very important problem.

The Blood Transfusion Service has met the greatly increased demand for whole blood yet again, in spite of the popular prejudice against the giving of blood which persists unfortunately in such a large section of our population. The response of the voluntary donors who have come forward has been magnificent, especially from the members of the armed forces. It is these people mainly who make a local transfusion service possible. That people of one race expect to receive blood from another, that relatives and friends demand this service without attempting to help, means that sooner rather than later the recruitment of donors will not keep pace with the demand and that people will die who should be saved unless public apathy and prejudice can be drastically jolted and a better response elicited. The most strenuous efforts are required to meet the demand so far. An attempt is being made to set up a panel of special donors belonging to the rare groups so that recipients who must receive this special blood can be speedily transfused. During the year dextran, a plasma substitute, has been stored for emergency use.

The scarcity of such important material as cortisone depends on the necessity to import from dollar sources. Apart from administrative problems which are always present when a specific treatment is in scarce supply, the Ministry of Health in the United Kingdom in its 1951 Report has this to say about treatment with this and similar material:

> Grave ethical as well as medical difficulties arise for specialist physicians who are responsible for selecting the patients for this treatment. It would be not only impossible, but also probably unjustifiable at present to provide continuous treatment with these substances for all those patients who might derive from them an initial relief of symptoms. The decision, made in 1949 to await a better knowledge of their mode of action and of the possible risks attending their use before attempting to make them generally available, appears to have been wise. The Medical Research Council, which receives for the clinical and laboratory investigations organised by its general committee on cortisone and allied substances a substantial part of the available supplies, is increasingly active in this field. The results of their work and of that in other countries will no doubt eventually provide a scientific basis for the wider therapeutic use of these potent hormonal agents. It seems clear that treatment should be started only on patients who can be observed closely from day to day until their response has been determined and that frequent observations should be continued as long as treatment is maintained. These considerations support the present policy of only releasing cortisone and A.C.T.H. on a limited scale for use in hospitals.

In consequence measures were taken to include such remedies as cortisone in the dangerous drugs schedule.

The action taken to improve strict quarantine control in such a dangerous area as this undoubtedly assisted the Colony in preventing the admission of dangerous infectious disease. The problems confronting the health authority which is responsible for protecting the public against such imported danger are far more complex and difficult in Singapore than in many western regions. In consequence the remarks made by the Ministry of Health of the United Kingdom that:

> The increasing use of air services and the enhanced speed of shipping reduce the opportunities for detecting such diseases as small-pox in their early stages at the ports of entry

apply far more severely here. The relaxation of port control so strongly demanded by outside territories would be of no comfort to those who died as a consequence. A good deal of study went to the proposed new International Sanitary Regulations submitted by the World Health Organization and their effect on present quarantine control. The possible danger from yellow fever importation received particular attention in view of the importance of the fine new international airport in course of construction which must become not only a world transport nerve centre of the immediate future but a very important factor in the international standing of Singapore.

The remarks made in the 1951 Report on staff welfare still apply. The well-being of the personnel of the Department continues to be the subject of the most active concern, and the closest attention was paid to all complaints by the representatives of the unions concerned.

Civil Medical Defence has received a concentrated study since the appointment of an officer for this particular purpose. The Medical Services in an emergency will have to be expanded considerably, for not only will it be necessary to provide hospital accommodation for the ordinary sick, but additional provision must be made for the treatment of civilian casualties. So it is essential in peacetime to make plans to provide not only for the necessary number of additional beds and for the expansion of the ancillary services but also to ensure that the necessary additional staff will be trained and that medical stores and equipment are available.

An Emergency Medical Plan has been framed which calls for the formation of a number of casualty hospital units, the establishment of static first aid posts and the creation of mobile first aid units. In addition expansion of the ancillary services is planned. These casualty hospital units and services will be equipped and built up gradually.

One service in particular which will be of the utmost importance is the Blood Transfusion Service. The requirements in an emergency will be considerably greater than at present. A large scale expansion of this essential service is being planned. Very many more blood donors will be needed, and plans are being made to recruit them.

A considerable number of trained additional staff will be required to man the expanded Medical Services and it is essential that this staff should be trained in peacetime. A Singapore Hospital Reserve has been formed, the 'Formation Rules' being gazetted as *Gazette* Notification No. 325 of 1952. Recruiting for the Reserve opened at the end of the year.

Medical stores and equipment are now segregated in an Emergency Medical Store and additional stores and equipment are on order.

The Director attended the *World Health Organization* regional committee meeting at Saigon in October when the urgent need for added attention to medical and nursing education and a stress on public health were emphasised. It was clear that many areas in the Western Pacific Region are far behind Singapore in these respects: that this Colony might well become a centre for advice and training in view of its recent advance in both the curative and preventive fields, its existing training facilities, and its ideal situation.

The special section on research will indicate what is being done in this direction but special mention should be made of *Japanese Type B Encephalitis*. This virus has been isolated from three fatal cases of encephalitis occurring in the Colony. In all cases the patients were under 10 years of age. Further investigation has revealed that race horses are also attacked by this virus although in general it is not a fatal disease in horses. It would appear that within six months of arrival in the country 90 per cent of horses have contracted either a subclinical or clinical infection. Investigations are proceeding to establish the extent of infection in the Colony and if possible the epidemiological conditions. Although the work is still at a very early stage it appears that infection with the virus is probably widespread but frank clinical cases of the disease presenting encephalitis symptoms are more uncommon. It is thought that certain cases previously diagnosed as poliomyelitis encephalitis may have been due to this virus. This incidence is of no consequence on the treatment or otherwise of such cases.

Perhaps it is not out of place to end this brief review with the following words from Sir John Charles' remarks in his introduction to the 1951 Report of the Chief Medical Officer to the Ministry of Health:

> Again I would affirm how much this country owes to its medical officers of health, sanitary inspectors, home visitors and the other staff of the health departments.
>
> Some notion of what we owe to them—in lives and suffering saved, infection prevented, invalidity shortened and hospital beds kept open for other diseases—may perhaps be got from the statistics given in the following chapters of this report, though the triumphs of preventive medicine are usually silent ones and soon forgotten.

And again

> Let those of us, who are charged with the responsibility of 'securing the maximum of those conditions of life for the individual and the community which are the frontier defence against disease', cease to deplore that which is lost and think only about those ample duties which remain.
>
> To us, perhaps more than to most men, apply the words of Bryce (1913) 'upon these citizens comes with special force the call to translate into reality that noble ideal of an educated democracy'.

TOTAL NUMBER OF OFFICERS AUTHORIZED AND AVAILABLE 1ST JANUARY, 1953

	Estimates 1953	Permanent	Short Contract and Temporary	Gone or going on long leave (including study)	Total to be available
A.—Administration					
Director	1	1	..	..	1
Deputy Director	1	1	..	..	1
Chief Health Officer	1	1	..	..	1
Chief Medical Officer	1	1	..	..	1
Chief Dental Officer	1	1	..	..	1
Medical Superintendent, Woodbridge Hospital	1	(on leave)	1 (Relief)	1	1
Medical Superintendent, Kandang Kerbau Maternity Hospital	1	1	..	..	1
Medical Superintendent, Tan Tock Seng Hospital	1	..	..	..	..
Deputy Chief Health Officer	1	..	..	..	..
Deputy Medical Superintendent, Woodbridge Hospital	1	..	..	..	..
Health Officer i/c Schools	1	1	..	..	1
Medical Officer i/c Out-patients Department	1	1 (acting)	..	..	1
Principal Matron	1	1 (acting)	..	1	1
B.—Hospital Division					
Specialist Officers, Grade 'A'	6	6	..	2	4
Specialist Officers, Grade 'B'	18	12	..	2	10
Medical Officers (excluding Housemen)	77	37	19	7	49
Housemen	36	..	23	..	23
Matrons	10	7 (2 acting)	..	1	6
Specialist Sisters	37	17	11	1	27
Sisters Expatriate	87	23	25	9	65
Sisters, Locally Appointed		26			
*Nurses	398	309	62	3	368
Hospital Assistants	209	170	36	10	196
Qualified Midwives	42	19	22	..	41
Dental Staff (including Housemen)	19	4	7	..	11
Pharmaceutical Chemists	2	2	..	..	2
Pharmacists	9	4	..	1	3
Laboratory Assistants	32	23	..	..	23
C.—Health Division					
Health Officers	24	7	8	..	15
Supervisor of Public Health Works	2	1	1	1	1
Chief Sanitary Inspector	1	1	..	..	1
Sanitary Inspectors	18	10	3	..	13
Matrons	2	2	..	..	2
Health Sisters	9	4	5	1	8
Health Nurses	41	8	18	..	26
Hospital Assistants	17	9	1	..	10
Qualified Midwives	43	23	9	..	32

Note:—Excluding one post of A.D.M.S. Civil Defence for two years only.
*The figure of 309 includes the January 1953 new school of 66 but excludes 51 Assistant nurses.

CHAPTER TWO

LEGISLATION

As has been pointed out in previous reports the initiation, drafting and passage through the Legislature of any new legislation or even amendment of existing legislation is inevitably a slow and prolonged process. In consequence much of the legislative action referred to in the 1951 Annual Report continued in 1952.

However the following measures were finalised and became law during the year under review:—

No. 8/1952 Registration of Dentists (Amendment) Ordinance.

No. 38/1952 Mental Diseases and Treatment Ordinance.

The Civil Defence (Singapore Hospital Reserve—Formation) Rules, 1952.

Minor amendments to Part I of the Poisons List and the 1st and 3rd schedules to the Poisons Rules.

Legislation being finalised or still under consideration was as follows:—

The Medical Registration Ordinance.

The Hospitals Board (Amendment) Ordinance.

The Poisons (Amendment) Ordinance.

The Registration of Pharmacists (Amendment) Ordinance.

The Advertising and Sale of Medicine Ordinance.

The Nursing Homes and Maternity Homes Ordinance.

The Midwives (Amendment) Ordinance.

The Mental Deficiency Ordinance.

The Therapeutic Substances Ordinance.

The Rules under the Sale of Food and Drugs Ordinance.

CHAPTER THREE

STAFF WELFARE

MR. D. B. ALCOCK, the Chief Welfare Officer to the Commissioner for Labour, writes as follows:—

The Personnel and Welfare Officer attached to the Government Medical Department is now taking a much larger share of the day to day work of personnel administration as well as dealing with all staff welfare problems. Owing to the recruitment of two further Personnel and Welfare Officers to the Personnel and Welfare staff in general it will gradually become possible for him to give all his time and energy to the Department. The Department, owing to the scattered nature of its personnel has its own peculiar problems and considerable savings in labour costs are envisaged by increasing the mobility of labour, reducing time spent on unproductive activities such as pay parades and generally increasing the effectiveness of the labour force. At the request of the Chief Health Officer a report has been submitted and other recommendations will follow. It should perhaps be mentioned that although the Department is carrying an increasing load the actual staff numbers are down on last year's figures and some of the still increasing load is hoped to be carried by the increasing efficiency of the present staff.

Happy relations exist between the Department and the two Labour Unions and are of such a kind that contacts have been in the nature of personal calls rather than formal letters. In fact one of the notable features has been the quietness of the Labour front in general and a lack of written complaints of "injustices" which tend to take up an undue amount of the time of various officials and can lead to endless correspondence and ill feeling. These informal meetings with the Secretaries of the Unions have been of great mutual benefit particularly regarding the quick resolution of small problems and grievances.

Owing to the lower staff figures quoted above the year has shown a diminution of the membership of the Health Division Co-operative Credit Society. As will be seen below however, this need cause no concern as the savings of the staff have again shown a marked increase. While the work thrown on the Hon. Secretary in the person of the Personnel and Welfare Officer is very much greater than was at first envisaged it is still felt that its very real results and contributions to welfare justify the time taken. The primary reason for this expenditure of time was as a means of combating the debt proneness of the staff. In fairness to the labourers of the Department it should be said at once that there is no section of Government employees less embarrassed by serious debts than they are. The word 'serious' is inserted as under the monthly system of payment it is inevitable that at different periods of any month the labourer in common with others is in debt to the shops, a privilege which the shops extend thereby assuring themselves of the customers' loyalty and at the same time no doubt reimbursing themselves for the facility, as they must. The Welfare section favours a weekly system of payments; one of the Unions concerned has now become convinced that more frequent payment is desirable and has compromised by a suggestion of a scheme of mid-month advances: but the rival Union appears to wish the present system to continue, as it no doubt must until opinion has veered round much further.

The Welfare Officer spends a very great deal of time extricating much more highly paid individuals from serious indebtedness but apart from a few cases which were successfully dealt with over a year ago, it would appear that our labourers are amongst the most provident members of the community. That no indebtedness other than shop credit, or to the Society itself, exists would be a rash supposition, but it is quite certain that the problem, if any, is a mild one. The labourers' ability to make ends meet demonstrates that other factors than a high cost of living have to be considered when dealing with the general problem of indebtedness and that debt itself neither proves the inadequacy of a wage structure, as some have suggested, any more than freedom from debt implies adequacy.

The Society's results are as follows:—

	Year ended 31st Dec., 1952		*Year ended 31st Dec., 1951*	
	$	c.	$	c.
Post Office Savings Account ...	7,932	08	12,657	28
Chartered Bank	12,890	74	8,958	16
Cash in transit	2,519	34	1,862	03
Investments	40,506	25	31,506	25
Loans outstanding	7,472	00	4,878	00
Total Credit Balances ...	71,320	41	59,861	72
Nett increase			$11,458.69	
Membership	396		420	
Total staff eligible	679		721	

The Medical Department as a whole requested the appointment of two Personnel and Welfare officers and it is hoped to allocate the second during the coming year.

Progress was made with staff housing, and in particular the Nurses Hostel mentioned elsewhere is expected to be ready for occupation early in 1953.

The Senior Hospitals Staff Committee met regularly and matters affecting the efficiency of the running of the Government hospitals came under constant review.

The Department's Interim Joint Council held various meetings with the Medical Directorate. On this Joint Council the Singapore Medical Services Union is fully represented.

The Nurses Representative Council continued to hold meetings at various times during the year. At these, problems peculiar to the female side of the staff are discussed, and representations are forwarded to the more formal meetings of the Interim Joint Council.

In December a very successful concert was presented by members of the General Hospital Welfare Committee, in which members of the various divisions of the staff took part. An equally successful sports meeting was held in September which was thoroughly enjoyed.

During the year protracted negotiations took place between the Mental Hospital Uniformed Staff Union and Government, particularly on the question of increased salary. In November Government offered an award which was still under consideration at the New Year.

Three hospital assistants and eight nurses proceeded overseas on study leave.

Two gold medals presented by the Singapore Medical Services Union to the best all-round nurses completing the nurses training course were awarded for the years 1950 and 1951 to Miss Millicent Minjoot and Miss Ang Lay Wah respectively.

CHAPTER FOUR

VITAL STATISTICS

POPULATION

COLONY OF SINGAPORE

(Excluding Cocos and Keeling Islands)

THE PRESENT population figure for mid-year 1952 is based on the actual 1947 census figure plus migrational surplus plus excess births over deaths since then. On this calculation the estimate is 1,077,155.

Details by race since 1911 are as follows:—

Year	Chinese	Malays	Indians	Europeans	Eurasians	Others	Total
1911 (Census) ..	219,577	41,806	27,755	not available		..	303,321
1921 (Census) ..	315,151	53,595	32,314	6,145	5,436	5,717	418,358
1931 (Census) ..	418,640	65,014	50,811	8,082	6,903	8,295	557,745
1947 (Census) ..	729,473	113,803	68,967	9,279	9,110	7,512	938,144
1948 (Mid year) ..	749,591	116,364	69,474	9,660	9,354	7,599	962,042
1949 (Mid year) ..	761,962	119,623	70,749	10,923	9,716	7,845	980,818
1950 (Mid year) ..	789,160	123,624	72,467	11,504	10,093	8,605	1,015,453
1951 (Mid year) ..	806,690	127,063	75,601	12,785	10,451	9,343	1,041,933
1952 (Mid year) ..	830,079	131,664	80,096	14,565	10,820	9,931	1,077,155

Attention is again drawn to the increase in Singapore's population. In the 21-year period from 1911 to 1931 the increase was some 83 per cent when the cause was due to large scale immigration from India and China. Since 1931 the overall increase is about 91 per cent due in the main to an increasing natural (births over deaths) means. This natural increase has become phenomenal over the post-war period and has in fact been vitiated over recent years by a balance of emigration over immigration. In 1931 the number of females to males was 584 to 1,000. The ratio is now 873 to 1,000. Thus the intense overcrowding, the very young ages at which women marry and the increase in the young state of the population are the factors of real significance in present and future local population trends.

NOTES ON COCOS KEELING ISLANDS—1952 POPULATION

1952 (Mid year)	
Chinese	18
Malaysians	406
Indians and Pakistanis	3
Europeans	123
Eurasians	—
Other races	2
Total ..	552

A reduction of 665 over the last 12 months.

It will be observed from a following table that while the ages of mothers range from 12 years to more than 45 years, no less than 7,478 babies out of a total of 51,196, i.e. nearly 15 per cent, were born to women under 21 years. What effect this must have in contributing to our comparatively high infant mortality rate as judged by Western standards it is difficult to assess. Indeed, the fact that the Malays who have the highest infant mortality rate (120.01 against the 69.97 for all races), gave birth to 2,222 out of a total of 6,848 deliveries, i.e. more than 32 per cent, in this age group (12–20) of childhood and near childhood, would suggest that pregnancy in these years carries an added risk of death to the new-born infant.

BIRTHS AND BIRTH RATES

	1931		1947		1952	
	Number	Rate	Number	Rate	Number	Rate
Chinese	15,993	37.85	33,629	46.20	39,088	47.09
Malays	2,862	43.69	5,473	47.73	6,858	52.09
Indians	1,020	19.64	3,087	43.30	3,672	45.84
Europeans	169	20.55	312	35.79	757	51.97
Eurasians	199	28.53	359	39.84	359	33.18
Others	227	29.09	185	28.27	460	46.32
Unknown	..	..	..	..	2	..
Total ..	20,470	36.37	43,045	45.89	51,196	47.53
Males	10,753	..	22,152	..	26,342	..
Females	9,717	..	20,893	..	24,854	..
Total ..	20,470	..	43,045	..	51,196	..
Male births per 100 births	52.04		51.23		51.45	

CHRISTMAS ISLAND

1952 (Mid year)

Chinese	1,274
Malaysians	377
Indians and Pakistanis	6
Europeans	86
Eurasians	—
Other races	—
Total ..	1,743

An increase of 221 over the last 12 months.

BIRTHS AND DEATHS, 1952

COCOS KEELING ISLANDS

	Males	*Females*
Births	6	12
Deaths	4	3

CHRISTMAS ISLAND

	Males	*Females*
Births ..	33	37
Deaths ..	3	6

BIRTHS BY SEX AND RACE, 1952

	Urban Area	Rural Area	Singapore Total
Males			
Europeans	126	264	390
Eurasians	161	24	185
Chinese	14,795	5,286	20,081
Malays	1,983	1,565	3,548
Indians	1,537	381	1,918
Others	155	64	219
Unknown	1	..	1
Total ..	18,758	7,584	26,342
Females			
Europeans	131	236	367
Eurasians	159	15	174
Chinese	14,075	4,932	19,007
Malays	1,866	1,444	3,310
Indians	1,398	356	1,754
Others	167	74	241
Unknown	1	..	1
Total ..	17,797	7,057	24,854
Grand Total ..	36,555	14,641	51,196

The annual increase in the number of births over the post-war period is seen to be continuing at a phenomenal rate. The 1952 figure of 51,196 is an all-time record.

The crude birth rate is 47.53. The rising trend in the birth rate may appear a little perplexing when our improving standards of living, the promotion of adult education, and the fostering of a responsible attitude of parents to their children might be expected to promote family limitation. But almost certainly the intense overcrowding and the approaching parity between the sexes are the factors which will continue to more than counter-balance any such suggestions for a long time to come.

It is usually supposed that the Chinese are the most reproductive of the three main races in the country—Chinese, Malays and Indians. An examination of the figures based on the women in the child-bearing ages in the various races calculated from the age/sex distribution of the 1947 census would appear to indicate the ratios are as follows taking 100 as the standard for all races:—

Chinese	93.8
Malays	100.5
Indians	151.7

BIRTHS BY SEX, RACE AND MOTHERS' AGES, 1952

Mothers' Age	EUROPEANS		EURASIANS		CHINESE		MALAYS		INDIANS		OTHERS		UNKNOWN		TOTAL	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
12 years ..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	1
13 years ..	..	..	..	..	1	1	2	..	3	1	..	..	..	..	6	2
14 years ..	..	..	..	1	1	..	7	11	5	10	..	..	..	..	13	22
15 years ..	..	..	..	..	7	10	50	34	21	14	..	..	..	..	78	58
16 years ..	..	..	..	..	60	49	126	111	58	51	4	..	..	..	248	211
17 years ..	..	..	3	1	157	157	184	202	78	67	5	8	..	..	427	435
18 years ..	2	1	7	7	391	348	287	240	89	82	6	9	..	..	782	687
19 years ..	5	5	11	6	610	557	209	178	113	94	9	14	..	..	957	854
20 years ..	8	11	11	8	940	835	293	287	146	132	13	12	..	..	1,411	1,285
21 years ..	16	20	10	6	1,097	1,005	197	193	110	89	15	13	..	..	1,445	1,326
22 years ..	34	26	10	10	1,179	1,241	253	250	136	147	17	22	..	..	1,629	1,696
23 years ..	26	22	13	9	1,197	1,214	206	204	118	137	17	20	..	..	1,577	1,606
24 years ..	27	21	12	8	1,443	1,356	195	182	132	116	13	10	..	..	1,822	1,693
25 years ..	36	24	10	13	1,178	1,119	241	244	129	114	21	22	..	..	1,615	1,536
26 years ..	34	33	11	17	1,067	994	159	147	101	111	11	14	..	..	1,383	1,316
27 years ..	28	18	9	10	935	921	119	137	94	70	12	20	..	..	1,197	1,176
28 years ..	23	33	13	17	1,052	956	204	158	89	102	18	20	..	..	1,399	1,286
29 years ..	28	20	7	5	855	831	142	104	71	61	13	7	..	..	1,116	1,028
30 years ..	16	16	14	11	929	813	159	143	101	85	10	7	..	..	1,229	1,075
Carried forward	283	250	141	129	13,099	12,408	3,034	2,825	1,594	1,483	184	198	..	..	18,335	17,293

BIRTHS BY SEX, RACE AND MOTHERS' AGES, 1952

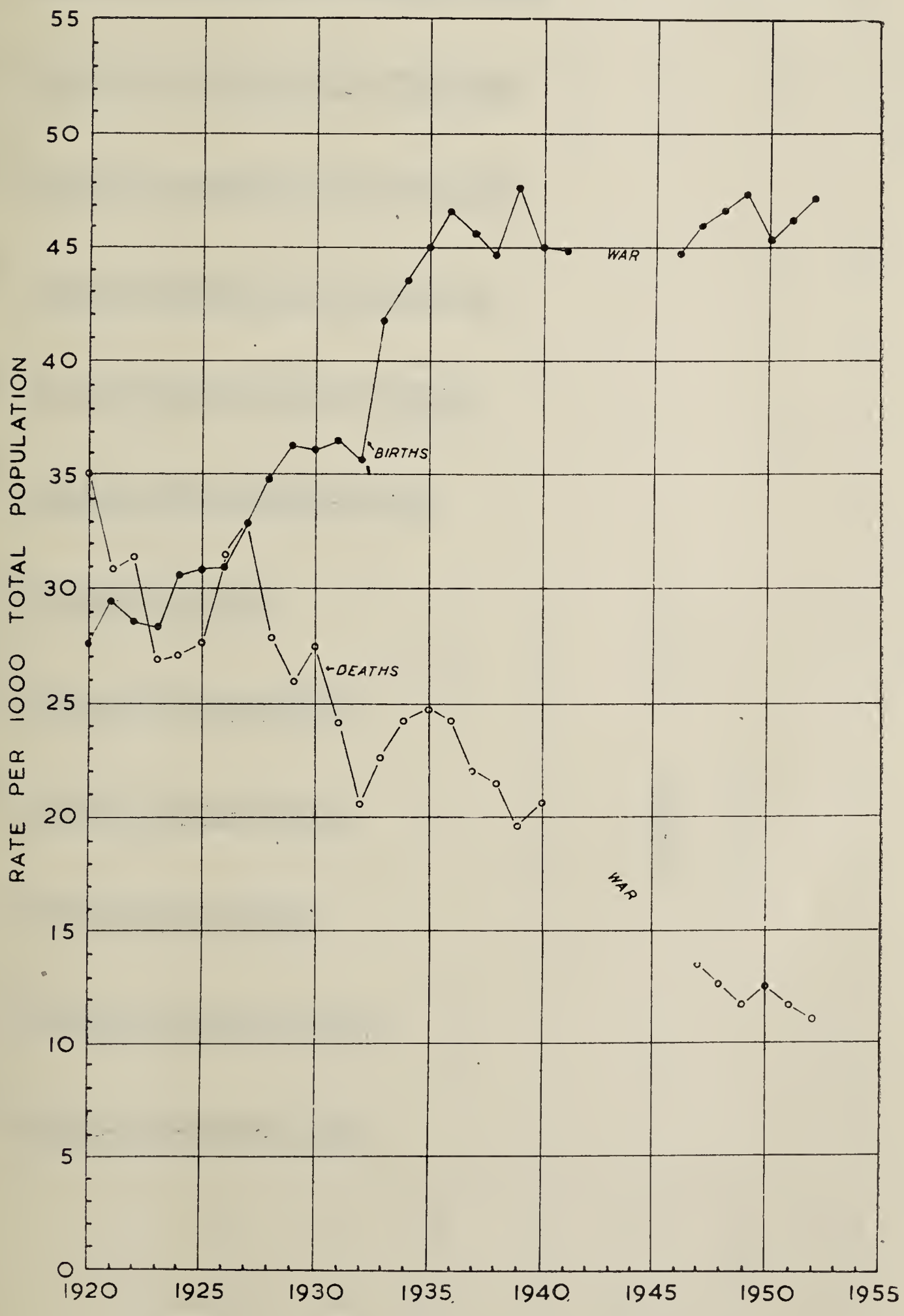
Mothers' Age	EUROPEANS		EURASIANS		CHINESE		MALAYS		INDIANS		OTHERS		UNKNOWN		TOTAL	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Brought forward	283	250	141	129	13,099	12,408	3,034	2,825	1,594	1,483	184	198	..	..	18,335	17,293
31 years ..	12	29	2	10	723	698	57	65	50	45	10	4	..	..	854	851
32 years ..	18	18	7	2	834	815	86	79	64	49	2	9	..	..	1,011	972
33 years ..	12	15	10	4	643	610	55	63	32	43	3	8	..	..	755	743
34 years ..	17	12	2	5	720	731	59	38	26	26	..	5	..	..	824	817
35 years ..	10	3	4	5	652	546	70	67	47	30	6	2	..	..	789	653
36 years ..	8	14	8	7	658	611	28	26	22	19	3	2	..	..	727	679
37 years ..	15	8	2	1	563	552	36	27	15	22	4	3	..	..	635	613
38 years ..	5	7	4	3	557	480	40	42	27	16	2	2	..	..	635	550
39 years ..	1	4	2	5	421	370	24	17	18	9	1	2	..	..	467	407
40 years ..	1	1	..	..	383	366	28	27	3	6	2	4	..	..	417	404
41 years ..	4	4	..	1	267	271	7	5	7	4	2	..	..	..	287	285
42 years ..	2	1	2	..	242	209	5	11	7	2	..	..	..	..	258	223
43 years ..	1	..	1	2	125	158	6	7	3	..	..	..	..	..	136	167
44 years ..	..	..	..	..	94	87	4	3	2	..	..	2	..	..	100	92
45 years ..	..	1	..	..	45	41	6	4	1	..	..	..	..	..	52	46
Over 45 years	1	..	..	..	55	54	3	4	..	..	..	..	..	..	59	58
Unknown ..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1
Total ..	390	367	185	174	20,081	19,007	3,548	3,310	1,918	1,754	219	241	1	1	26,342	24,854

Fig. 1

SINGAPORE

TREND OF CRUDE BIRTH AND DEATH RATES: 1920 ONWARDS

(Rates are the number of births reported per 1,000 total population:
Rates are the number of deaths reported per 1,000 total population)

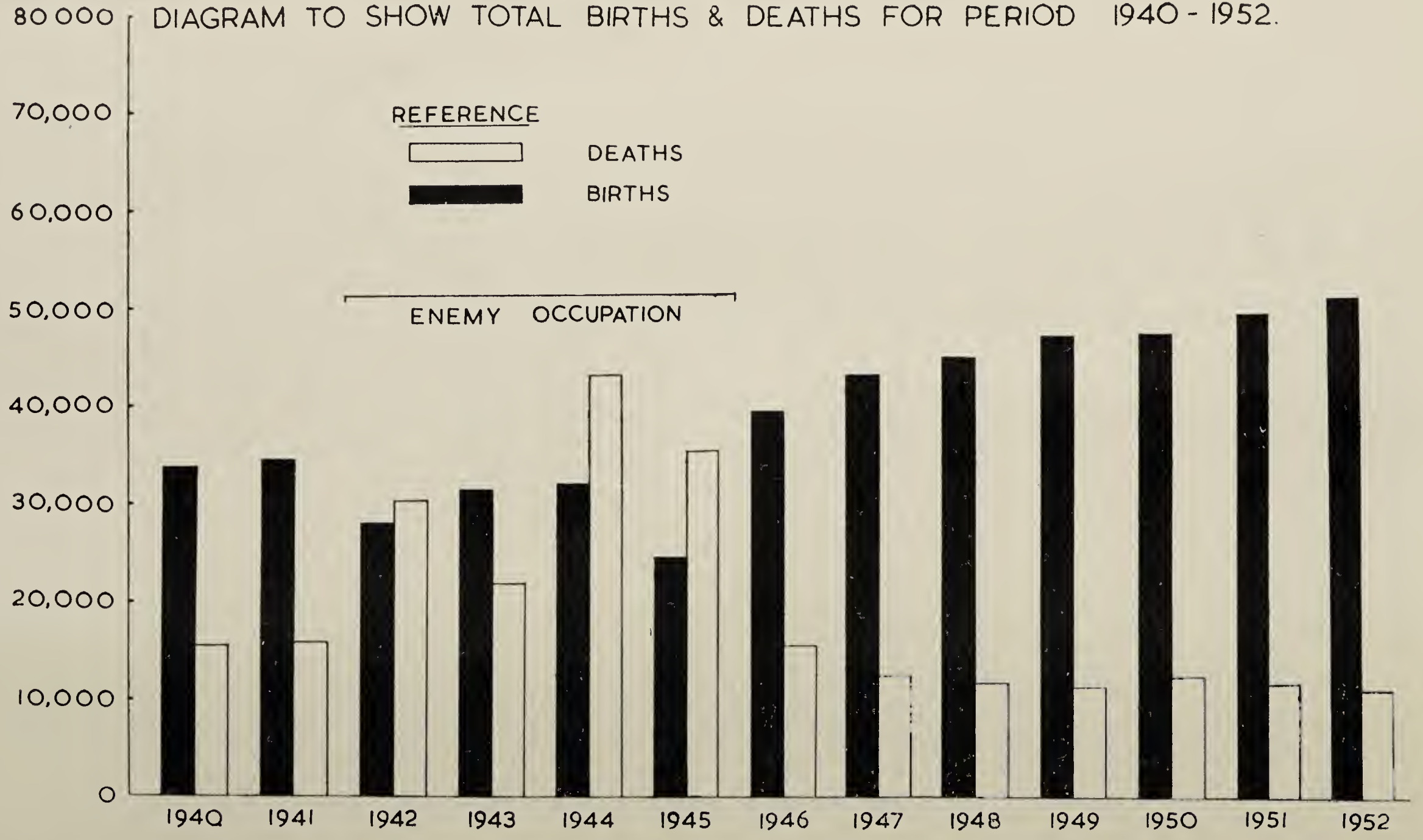


Department of Social Medicine and Public Health, University of Malaya

Fig. 2

SINGAPORE

DIAGRAM TO SHOW TOTAL BIRTHS & DEATHS FOR PERIOD 1940 - 1952.



Department of Social Medicine and Public Health, University of Malaya

DEATHS AND DEATH RATES

	1931		1947		1952	
	Number	Rate	Number	Rate	Number	Rate
Chinese	10,599	25.09	9,368	12.87	9,050	10.90
Malays	1,905	29.08	2,029	17.70	1,922	14.60
Indians	820	15.81	878	12.32	798	9.96
Europeans	51	6.20	74	8.49	103	7.07
Eurasians	103	14.76	84	9.32	85	7.86
Others	145	18.58	78	11.92	93	9.36
Unknown	..	..	..	..	8	..
Unknown Sex and Race	..	..	..	..	1	..
Total ..	13,623	24.20	12,511	13.34	12,060	11.20

DEATHS BY SEX AND RACE, 1952

	Urban Area	Rural Area	Singapore Total
Males			
Europeans	52	27	79
Eurasians	35	7	42
Chinese	4,211	1,003	5,214
Malays	647	442	1,089
Indians	464	86	550
Others	33	21	54
Unknown	5	..	5
Total ..	5,447	1,586	7,033
Females			
Europeans	15	9	24
Eurasians	36	7	43
Chinese	3,131	705	3,836*
Malays	494	339	833
Indians	208	40	248
Others	30	9	39
Unknown	3	..	3
Unknown Race and Sex ..	1	..	1
Total ..	3,365	1,109	5,027
Grand Total ..	9,365	2,695	12,060

* Includes one unknown sex.

DEATHS BY AGE GROUPS, 1952

Age	Urban Area	Rural Area	Total
Under 1 day	325	91	416
1 day and under 1 week ...	349	100	449
1 week and under 2 weeks ...	289	50	339
2 weeks and under 3 weeks ...	253	46	299
3 weeks and under 4 weeks ...	104	15	119
NEO-NATAL DEATHS	1,320	302	1,622
4 weeks and under 2 months ...	305	136	441
2 months and under 3 months ...	234	84	318
3 „ „ „ 4 „ ...	161	51	212
4 „ „ „ 5 „ ...	132	51	183
5 „ „ „ 6 „ ...	101	40	141
6 „ „ „ 7 „ ...	111	33	144
7 „ „ „ 8 „ ...	86	28	114
8 „ „ „ 9 „ ...	90	26	116
9 „ „ „ 10 „ ...	88	25	113
10 „ „ „ 11 „ ...	79	27	106
11 „ „ „ 1 year ...	56	16	72
INFANT MORTALITY	2,763	819	3,582
1 — 4 years	1,125	377	1,502
5 — 9 „	249	69	318
10 — 14 „	125	28	153
15 — 19 „	150	50	200
20 — 24 „	193	51	244
25 — 29 „	203	55	258
30 — 34 „	282	57	339
35 — 39 „	345	80	425
40 — 44 „	429	113	542
45 — 49 „	532	101	633
50 — 54 „	664	163	827
55 — 59 „	579	131	710
60 — 64 „	608	148	756
65 — 69 „	413	131	544
70 — 74 „	307	136	443
75 — 79 „	197	92	289
80 — 84 „	133	49	182
85 and over	62	37	99
Unknown	6	8	14
Grand Total ...	9,365	2,695	12,060

DEATHS GROUPED ACCORDING TO AGE, SEX, AND RACE, 1952

Age Groups	Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others	Unknown	Unknown Sex and Race	Total
Under 1 day	M.	4	1	164	43	25	2	2	1	241[1]
	F.	1	1	119	38	10	3	2		174[1]
1 day and under 1 week ..	M.	6	..	173[1]	56	26	3	..	..	264[1]
	F.	3	2	131[1]	31	14	3	..	..	184[1]
1 week and under 2 weeks ..	M.	..	..	150	15	13	3	..	..	181
	F.	1	1	124	20	11	1	..	..	158
2 weeks and under 3 weeks ..	M.	..	..	93	28	13	1	..	..	135
	F.	..	1	138	14	11	..	..	..	164
3 weeks and under 4 weeks ..	M.	1	1	32	15	1	1	..	..	51
	F.	1	1	49	11	6	..	..	..	68
NEO-NATAL DEATHS ..	M. and F.	17	8	1,174	271	130	17	4	1	1,622*
4 weeks and under 2 months ..	M.	1	..	136	87	19	3	..	..	246
	F.	..	..	133	50	10	2	..	..	195
2 months and under 3 months ..	M.	1	1	107	64	16	3	..	..	192
	F.	..	1	91	28	5	1	..	..	126
3 months and under 4 months ..	M.	..	..	62	40	8	..	..	..	110
	F.	..	1	67	26	5	3	..	..	102
4 months and under 5 months ..	M.	1	..	45	35	4	..	..	..	85
	F.	1	1	67	19	8	2	..	..	98
5 months and under 6 months ..	M.	1	..	54	26	..	1	..	..	82
	F.	..	1	32	20	6	..	..	..	59
6 months and under 7 months ..	M.	1	1	62	20	2	..	..	..	86
	F.	..	..	36	16	5	1	..	..	58
7 months and under 8 months ..	M.	..	..	42	16	6	..	..	..	64
	F.	..	1	34	14	..	1	..	..	50
8 months and under 9 months ..	M.	..	1	39	20	1	..	..	..	61
	F.	..	..	35	18	2	..	..	..	55
9 months and under 10 months	M.	..	..	47	14	4	1	..	..	66
	F.	..	..	36	8	3	..	..	..	47
10 months and under 11 months	M.	..	..	39	9	4	..	..	..	52
	F.	..	..	43	9	2	..	..	..	54
11 months and under 1 year ..	M.	1	..	19	6	3	1	..	..	30
	F.	..	1	34	7	..	..	..	..	42
INFANTILE MORTALITY .. *Carried forward*	M.	17	5	1,264	494	145	19	2	1	1,946
	F.	7	12	1,169[1]	329	98	17	2		1,634
Sub-Total	M. and F.	24	17	2,434	823	243	36	4	1	3,582*

DEATHS GROUPED ACCORDING TO AGE, SEX, AND RACE, 1952—*contd.*

Age Groups	Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others	Unknown	Unknown Sex and Race	Total
Brought forward ..	M.	17	5	1,264[1]	494	145	19	2	1	1,946
	F.	7	12	1,169[1]	329	98	17	2		1,634
1— 4 years	M.	4	3	580	151	38	1	..	..	777
	F.	3	..	535	136	44	7	..	..	725
5— 9 years	M.	1	1	122	25	4	3	..	..	156
	F.	..	..	129	22	10	1	..	..	162
10—14 years	M.	..	..	79	17	3	..	..	..	99
	F.	1	..	41	10	2	..	..	..	54
15—19 years	M.	3	2	92	15	3	..	..	..	115
	F.	..	1	60	23	1	..	..	..	85
20—24 years	M.	10	1	78	24	7	1	..	..	121
	F.	..	1	79	30	11	2	..	..	123
25—29 years	M.	5	1	92	26	21	5	..	..	150
	F.	2	1	68	27	10	..	..	..	108
30—34 years	M.	5	2	137	25	42	1	..	..	212
	F.	2	..	91	21	13	..	..	..	127
35—39 years	M.	..	2	203	28	46	2	..	..	281
	F.	1	1	114	21	7	..	..	..	144
40—44 years	M.	2	..	277	37	35	4	..	..	355
	F.	1	3	131	38	12	2	..	..	187
45—49 years	M.	6	3	350	28	53	2	..	..	442
	F.	1	..	151	32	7	..	..	..	191
50—54 years	M.	8	6	438	61	63	6	..	..	582
	F.	2	2	197	33	11	..	..	..	245
55—59 years	M.	8	4	407	47	33	2	1	..	502
	F.	..	3	175	20	7	3	..	..	208
60—64 years	M.	3	4	438	34	36	2	..	..	517
	F.	..	7	198	29	3	2	..	..	239
65—69 years	M.	3	3	278	28	7	4	..	..	323
	F.	2	2	194	16	5	2	..	..	221
70—74 years	M.	3	3	200	19	3	1	..	..	229
	F.	1	3	187	18	4	1	..	..	214
75—79 years	M.	..	1	112	11	5	1	..	..	130
	F.	1	5	143	9	..	1	..	..	159
80—84 years	M.	1	..	50	9	4	..	..	..	64
	F.	..	2	104	9	2	1	..	..	118
85 years and over	M.	..	..	14	8	2	..	..	..	24
	F.	..	..	66	8	1	..	..	..	75
Unknown	M.	..	1	3	2	..	..	2	..	8
	F.	..	..	3	2	..	..	1	..	6
Grand Total ..	M.	79	42	5,214[1]	1,089	550	54	5	1	7,033
	F.	24	43	3,835[1]	833	248	39	3		5,025
	M. and F.	103	85	9,050	1,922	798	93	8	1	12,060

*Includes one unknown sex and race and one Chinese of unknown sex.

The death rate for 1952 is the lowest on record at 11.20 per 1,000 of the population and compares more than favourably with any Western country as a crude death rate. Taking the main causes of death which gave a return of 300 per million, it is seen that malaria and unspecified fevers show a remarkable fall over the year under review from an index figure of 45 to 26: pulmonary tuberculosis from 48 to 39: infantile convulsions from 56 to 41: diseases of the respiratory system excluding tuberculosis from 69 to 61. While deaths from diseases of the circulatory system, diseases of early infancy, typhoid and diseases of the digestive system generally and cancer tend to remain about the same for the present all main causes have in fact shown a very considerable fall over the post-war period except diseases of the circulatory system and cancer (see following table).

INFANT MORTALITY

Race	1931		1947		1952	
	Number	Rate	Number	Rate	Number	Rate
Chinese	3,041	183.83	2,671	79.43	2,434	62.27
Malays	722	261.35	784	143.25	823	120.01
Indians	171	163.73	236	76.45	243	66.19
Europeans	5	29.59	18	57.69	24	31.70
Eurasians	23	110.55	28	77.99	17	47.35
Others	34	149.78	21	113.51	36	78.28
Unknown	..	..	..	..	5	..
Total ..	3,996	191.30	3,758	87.33	3,582	69.97

———	URBAN AREA		RURAL AREA		SINGAPORE		Rate per mille of births
	Births	Deaths under one year	Births	Deaths under one year	Births	Deaths under one year	
FIRST QUARTER							
January							
February	8,363	661	3,333	207	11,696	868	74.21
March ..							
SECOND QUARTER							
April							
May	8,823	696*	3,627	189	12,450	885*	71.08
June							
THIRD QUARTER							
July							
August	9,557	685	3,811	205	13,368	890	66.39
September							
FOURTH QUARTER							
October							
November	9,812	721†	3,870	218	13,682	939†	68.63
December							
Total ..	36,555	2,763	14,641	819	51,196	3,582	69.97

*Includes one unknown sex and race.
†Includes one Chinese of unknown sex.
Rate per mille of births for 1952=69.97.

Fig. 3

SINGAPORE

TREND OF INFANT MORTALITY RATES: 1920 ONWARDS

(Rates are the number of deaths reported under one year of age per 1,000 live births)

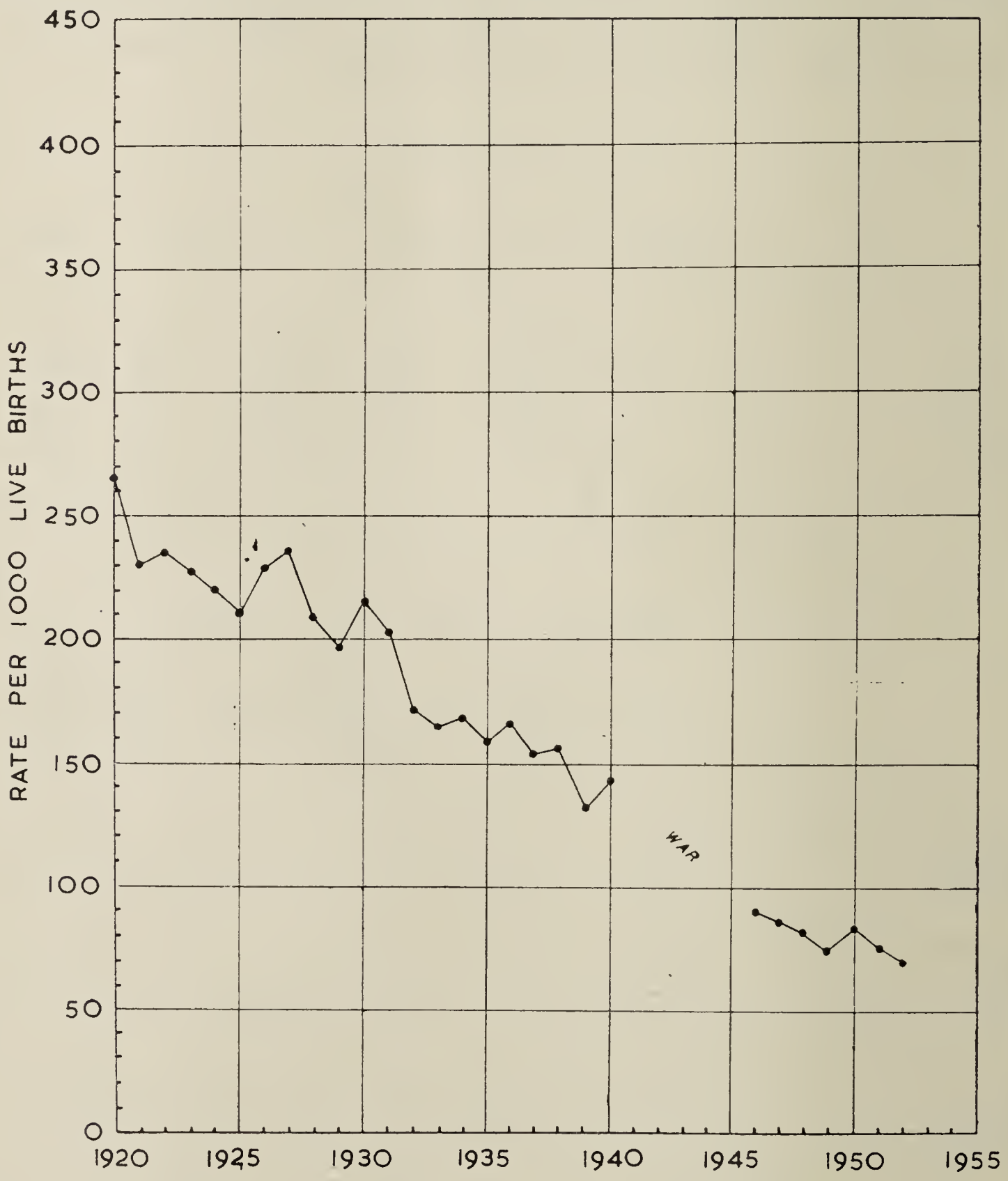


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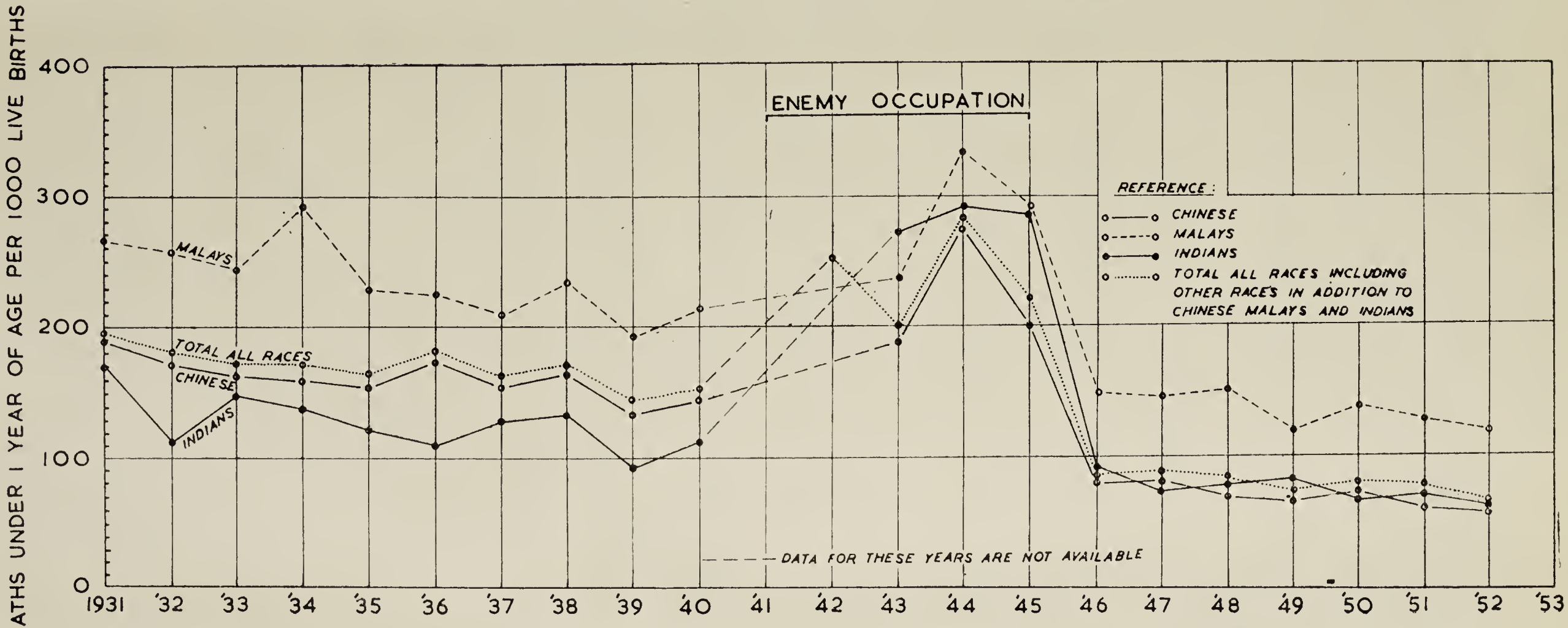
Fig. 4

SINGAPORE

INFANT MORTALITY RATES BY RACE: 1931 ONWARDS

(Rates are the number of deaths reported under one year of age per 1,000 live births)



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For the first time in Singapore's history the infant mortality rate has fallen under 70 infant deaths under one year of age per 1,000 live births—a considerable drop from the 75.15 figure of 1951. This compares very favourably indeed with the 1939 figure of 130.43 and 285.0 in 1944. For the three main races—Chinese, Malays and Indians—the Chinese rate is still the lowest at a record of 62.27 as compared with 66.69 in 1951, the Indian being a close second with 66.19 as compared with 70.66 in 1951. The Malay rate has also reached a new low of 120.01 as compared with 136.75 in 1951.

Naturally the present rate has still a long way to go to reach the figure attainable in such countries as England and Wales which now approximates to 30 infant deaths under one year of age per 1,000 live births, but there can be no true comparison between an Eastern territory such as Singapore and a Western country such as the United Kingdom. The former is subject to disease conditions which are unknown in England and its population is concentrated to a far greater extent in cubicle housing which creates the worst of slum conditions. In addition any territory which is subject to such a phenomenally high birth rate as that of Singapore will never be able to attain the low levels that are possible in countries with birth rates under 20. Furthermore areas with more than one race to deal with and with a large percentage still adhering to Eastern forms of medicine have additional problems which have considerable effects on the infant mortality rate.

A reason for the very high infant mortality rate amongst Malays has already been advanced above in the discussion on the ages of parturient mothers. Other causes are geographical, social and economic. Both in the City and in the Rural areas, the majority of Malays live in circumstances far from satisfactory in regard to modern standards of hygiene and sanitation. On the whole, they are not a wealthy people while the grandmother, the *pawang* and the *dukun* (the local medicine man) still wield their traditionally powerful influence in the household.

There is reason to believe that the real rate is probably lower than the 69.97 stated. The Colony of Singapore has always recorded a very much lower still birth rate than England and Wales. For example, in the year 1952, our rate was 15.4 per 1,000 births as against 22.6 for England and Wales in 1950. On the other hand our neo-natal mortality rate is extremely high, *viz.:* 31.7 in Singapore 1952, and 18.6 in England and Wales 1950. While there is a possibility that not all still births are registered, the probable practice has been to register them as born alive. Further, obstetrical enthusiasm much evident in recent years may be responsible for bringing into the world babies who die after breathing when usually they would have been born dead. This argument is further strengthened by the fact that in the City area where all medical practitioners are concentrated and where the Kandang Kerbau Maternity Hospital is situated, proportionately 3 times as many deaths due to prematurity are recorded than in Rural Singapore, *viz.:* 10.9 per 1,000 of all city births and 3.3 per 1,000 of all rural births and 8.8 per 1,000 of all births.

If allowance is made for the low still birth rate only, i.e. by recording a requisite number of the neo-natal deaths as still born to make the still birth rate approximate to 22.6 per 1,000, then the neo-natal mortality rate drops to 23.5 per 1,000 live births and the infant mortality rate to 60.9 per 1,000 live births. Admittedly an investigation into the entire statistical procedure in this respect is needed.

TOTAL NUMBER OF DEATHS, RATE PER MILLION OF POPULATION AND COMPARISON WITH THE AVERAGE RATE FOR 1939/1941 BY PRINCIPAL CAUSES OF DEATHS

Causes	AVERAGE 1939/41		1947			1950			1952		
	No. of Deaths	Rate per million	No. of Deaths	Rate per million	Index	No. of Deaths	Rate per million	Index	No. of Deaths	Rate per million	Index
Malaria and Unspecified Fever ...	1,159	1,547	1,207	1,274	82	819	806	52	438	407	26
Violence (all forms)	477	637	573	605	95	494	486	76	467	434	68
Beri-beri	654	873	398	420	48	246	242	28	257	239	27
Senility	927	1,237	955	1,008	81	1,033	1,017	82	925	859	69
Pulmonary Tuberculosis	1,714	2,288	1,468	1,550	68	1,211	1,193	52	956	888	39
Heart Diseases	491	655	403	425	65	567	558	85	692	642	98
Diseases of the Circulatory System ..	168	224	112	118	53	204	201	90	204	189	84
Diseases of Pregnancy, Childbirth and the puerperal state	145	192	125	132	68	86	85	44	91	84	44
Premature births and diseases of early infancy	849	1,135	853	900	79	812	800	70	827	768	68
Infantile convulsions	1,793	2,393	1,519	1,603	67	1,364	1,343	56	1,052	977	41
Diseases of the respiratory system excluding tuberculosis and influenza	2,216	2,958	1,878	2,012	68	2,034	2,003	68	1,953	1,813	61
Typhoid, Dysentery, Diarrhoea and Enteritis	1,350	1,802	954	1,007	56	1,185	1,167	65	1,307	1,213	67
Other Diseases of the digestive system ..	409	546	253	267	49	429	422	77	316	293	54
Tuberculosis other than respiratory system	186	248	167	176	71	266	262	106	250	232	94
Diseases of the genito-urinary system ..	548	731	277	292	40	242	238	33	361	335	46
Diseases of the nervous system ..	438	585	263	278	48	320	315	54	357	331	57
Influenza, Acute Rheumatism	279	372	208	220	59	86	85	23	74	69	19
Cancer	353	471	306	323	69	340	335	71	512	475	101
Others	1,147	1,531	592	625	41	574	565	37	1,021	948	62
Total ..	15,302	20,425	12,511	13,206	65	12,312	12,125	59	12,060	11,196	55

Indices are based on 1939/41 average rate per million of population.

MATERNAL MORTALITY

The maternal mortality rate was returned as 1.74 per 1,000 live births for the year under review, and can be considered a very satisfactory one under all the circumstances concerned. This compares with a rate of 7.0 in 1945 and 4.0 in 1939.

The same social forces which condone early marriage and motherhood and reliance on quacks for medical needs are in part responsible for our comparatively high maternal mortality rate of 1.8 per 1,000 compared with 0.66 in the United Kingdom in 1951. Another reason is that our medical services are in no respect as comprehensive as those provided in England and Wales, and cannot attain a fully satisfactory standard until the Medical Plan is nearer completion.

MIGRATION STATISTICS BY SEA AND AIR DURING 1952

IMMIGRANTS

Race	ADULTS		CHILDREN		Total
	Male	Female	Male	Female	
European	18,872	8,116	1,982	1,152	30,122
Eurasian	124	100	40	26	290
Chinese	19,628	6,641	2,152	1,477	29,898
Malaysian	3,537	1,100	335	328	5,300
Indian and Pakistani ..	23,308	2,657	1,169	809	27,943
Japanese	86	10	1	..	97
Other Races	1,664	396	93	61	2,214
Total all Races ..	67,219	19,020	5,772	3,853	95,864

EMIGRANTS

Race	ADULTS		CHILDREN		Total
	Male	Female	Male	Female	
European	18,844	7,757	1,680	1,064	29,345
Eurasian	81	56	20	15	172
Chinese	28,276	6,378	2,124	1,307	38,085
Malaysian	4,856	1,231	359	359	6,805
Indian and Pakistani ..	16,094	1,962	1,068	754	19,878
Japanese	76	10	1	..	87
Other Races	1,510	445	155	115	2,225
Total all Races ..	69,737	17,839	5,407	3,614	96,597

CHINESE DECK PASSENGERS FROM AND TO CHINA AND HONGKONG, 1952

Country	IMMIGRANTS				Total	EMIGRANTS				Total
	ADULTS		CHILDREN			ADULTS		CHILDREN		
	Male	Female	Male	Female		Male	Female	Male	Female	
China	1,349	1,578	693	452	4,072	4,305	866	560	448	6,179
Hong Kong ..	1,874	765	393	289	3,321	3,850	1,059	624	268	5,801
Total ..	3,223	2,343	1,086	741	7,393	8,155	1,925	1,184	716	11,980

Fig. 5

SINGAPORE

TREND OF MATERNAL MORTALITY RATES: 1931 ONWARDS

(Rates are the number of deaths reported from puerperal causes per 1,000 live births)

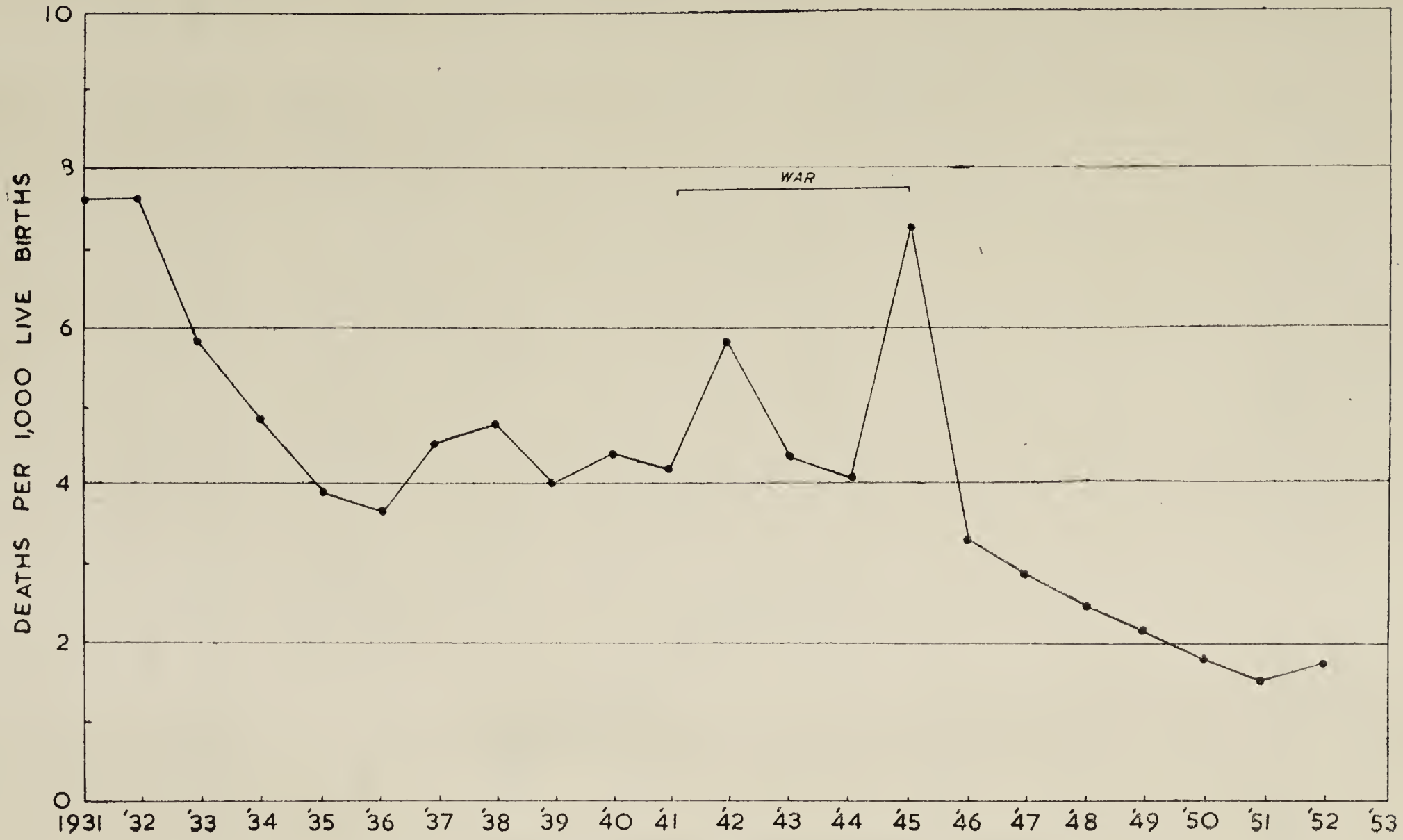

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Fig. 6

SINGAPORE

TREND OF BERI-BERI DEATH RATES: 1900 ONWARDS

(Rates are the number of deaths reported from beri-beri per 100,000 total population)

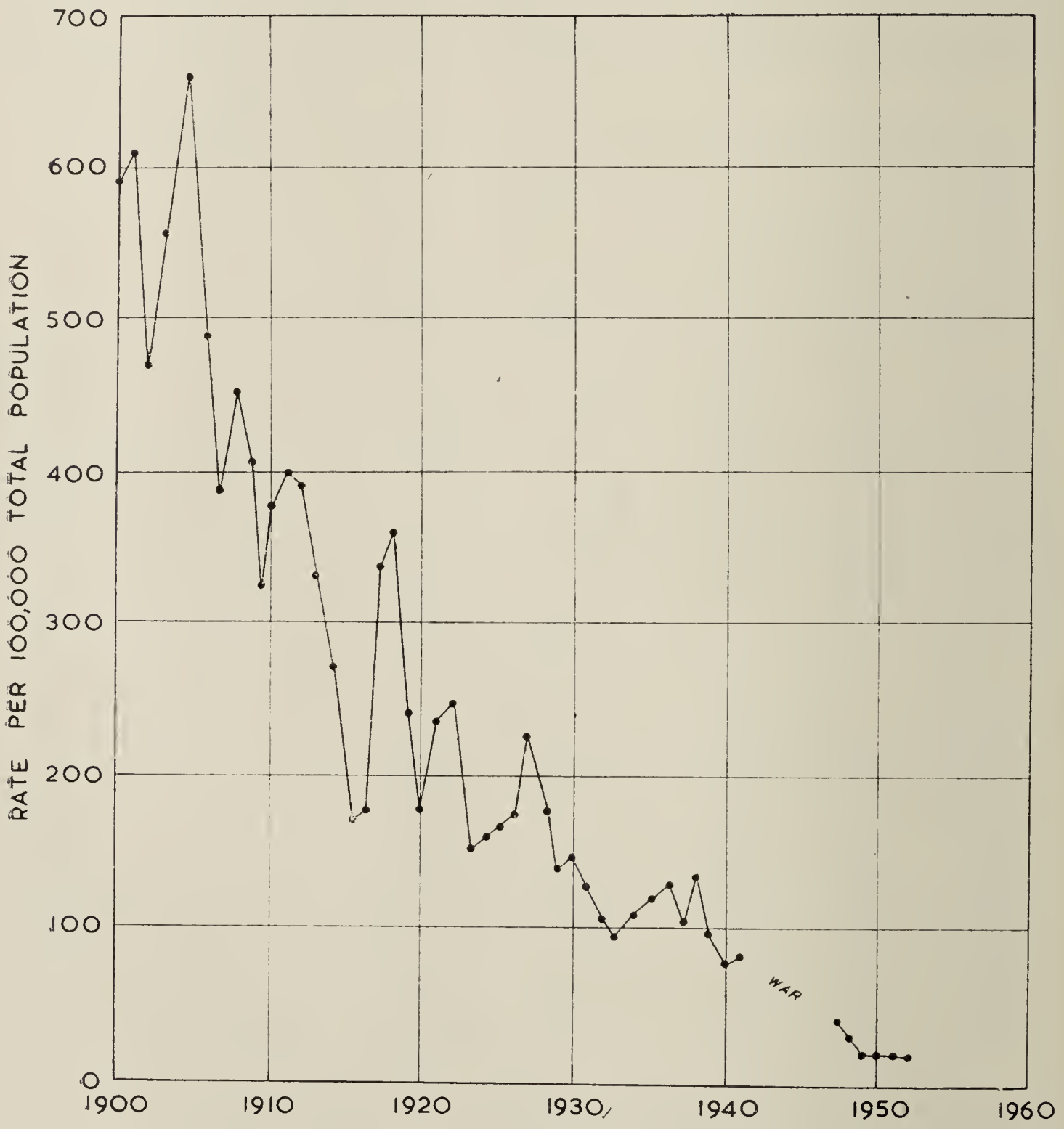

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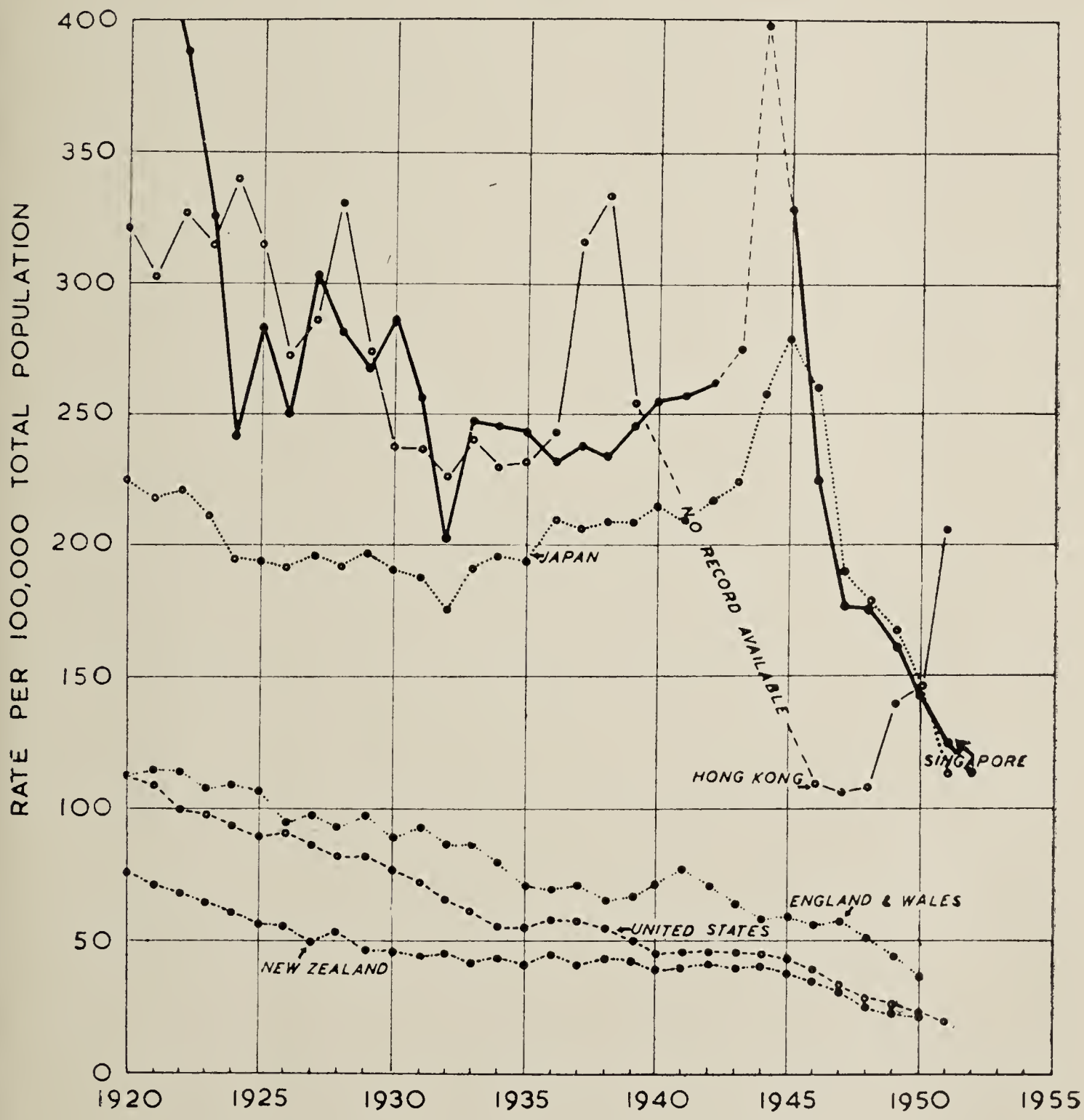
Fig. 7

TREND OF TUBERCULOSIS DEATH RATES: 1920 ONWARDS

(Singapore and certain other countries)

(Rates are the number of deaths reported from tuberculosis (all forms) per 100,000 total population)



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PART II

THE HEALTH DIVISION

CHAPTER FIVE

INTRODUCTION

THE COLONY of Singapore, situated at the southern extremity of the Malay Peninsula, some 90 miles north of the Equator, covers an area of 224 square miles. Included within its jurisdiction are a number of small islands, the total area of which is about 10 square miles. The country is undulating, interspersed with numerous swampy valleys and low hills, with Bukit Timah Hill rising to an altitude of 581 ft. These hills are the source of hill-foot springs and seepages wherein the dangerous malaria carrier, *A. maculatus,* may breed. Granite outcrops, which are the most characteristic feature of the island have been found to bear a close association with this breeding. Numerous tidal creeks leading into the land, in some instances for several miles, are responsible for the coastal swamps in which another dangerous carrier mosquito, *A. sundaicus,* can breed in abundance. The central part of the main island is a forest reserve along the periphery of which water collections in reedy ponds can give rise to the appearance of another malaria vector, *A. letifer.*

Utilisable land has been restricted mainly by three factors:—

(*a*) the built up area which now occupies at least a third of the land available;

(*b*) tidal swamps and other geographical circumstances which account for another 15 to 20 per cent; and

(*c*) about 10 per cent occupied by the Services. Thus with a population increasing by some $3\frac{1}{2}$ per cent per annum, Singapore has only some 70 square miles left to expand into. Housing needs must be met by building upwards rather than outwards if the requirements of health and of economy are to be met satisfactorily.

The Government of the Colony provides a considerable part of all the curative and preventive medical work carried out. There are two local authorities, the City Council which is responsible for environmental and some aspects of personal health within 31 square miles, and the Rural Board which is responsible for the health and welfare of more than 306,000 people living in the remaining 193 square miles. The provision and maintenance of hospitals, of clinics and dispensaries, of the School Medical and Dental Service, of air and sea Quarantine, of Rural Maternity and Child Welfare and even of anti-malarial measures, at least within the Rural Board area, and of certain minor obligations in relation to Crown Lands and Crown property within City limits, are all met by the Central Government.

The year witnessed some improvement in both accommodation and staff. Two new Maternity and Child Welfare clinics capable of expansion into proper Rural Health Centres were completed during the year. It was also possible to increase the Health personnel resulting in very much increased work. But our essential difficulties—that of accommodation and of staff—will continue unti the Ten Year Medical Plan is completed.

While the steep descent in all mortality rates over the post-war decade has been marked, it is nevertheless satisfying to observe that the general decline has been more than maintained over the past twelve months. Overcrowded Singapore, with a mid-year estimated population of 1,077,155 can claim to be among the healthiest seaports in the East. The continued freedom from major infectious diseases such as plague, cholera and small-pox, the

absence of malaria, the decreasing incidence of many respiratory infections and of the more lethal alimentary affections are the main causes for the improvements noted.

Nevertheless there is still much room for advancement and none for complacency. There are indications that the limits of improvement have now been reached, and unless changes are made in the direction of modern methods of general sanitary control, keeping pace with the increasing population, a tendency to deterioration may well develop over the next few years.

Quite apart from tuberculosis, premature births and diseases of early infancy, 3,906 out of a total of 12,060 deaths, i.e. 32 per cent, were due to such preventable diseases as unspecified fevers, infantile convulsions and diarrhœa and enteritis. Had it been possible to further augment the medical and social services a considerable further effect on our mortality and morbidity figures would have been made.

The Chief Health Officer is responsible on the one hand to the Director of Medical Services for all actual health services in the so-called 'Rural Area' of the Colony, for the School Medical and Dental Service, the B.C.G. vaccination campaign, and for all sea and air Quarantine services, and on the other hand to the Chairman, Rural Board, for all other 'environmental' services such as housing, drainage, sanitation and conservancy. Owing to the understanding and complete liaison that exist between the Director of Medical Services and the Rural Board, such divided responsibilities here have not tended to impede the normal work of the Government Health Division in any way.

The Chief Health Officer is a member of the Rural Board and advises the Board on matters of general policy affecting public health. The Health Division is in control of all scavenging and conservancy services and employs the labour engaged in such Rural Board duties. All building plans are scrutinised by the rural health officers, who besides being responsible for these executive functions also carry out all necessary anti-malarial measures. Three travelling dispensaries and one floating dispensary seek to reach the population in the rural districts the needs of which cannot be met as yet by establishing static institutions.

The Government Maternity and Child Welfare staff (apart from the Maternity Hospital reviewed in Chapter 20) does all its work in the rural areas, while the School Medical and Dental section looks after the health of both urban and rural school children and advises on school buildings.

The staff engaged directly on Rural Board duties is as follows:—

Health Officers	2
Supervisor, Public Health Works	1
Senior Sanitary Inspectors	2
Sanitary Inspectors	11
Technical Subordinates	27
Labourers: (*a*) Anti-malarial	—
(*b*) Scavenging	—
Drivers	—

(Paid from Rural Board Funds)

The Maternity and Child Welfare service is staffed as follows:—

Lady Health Officers	2
Public Health Matrons	1
Health Sisters (including Supervisor of Midwives) ...	5
Health Nurses	14
Health Midwives	30
Health Servants	23

In addition six school health officers and eight health nurses with two hospital assistants of the schools branch and one schools sanitary inspector do much of the work in the Rural Board area. There is also a public dispensary with a hospital assistant in charge at Bukit Timah and another at Paya Lebar. Although this latter dispensary is actually in the City area, it draws a large number of its patients from the rural districts around. The School Dental Service, although designed to cover all school children in Singapore, is as yet too small to reach the rural districts: a rural expansion in this connection is contemplated in 1953. A small school travelling dispensary operates under a nurse and a driver, in addition to the above.

The work of the Port Health section has to be maintained both from the point of view of the protection of the Colony from dangerous infectious disease from outside and for reasons of international obligations. The same statement also applies to work at the Airport, but here our difficulties are complicated by an ever-increasing tempo in air services which demand more personnel to keep control functioning satisfactorily.

The Maternity and Child Welfare section is keeping pace with the demands made upon it at the expense of a greatly over-worked staff. There is a grave tendency for new recruits to the service to resign after a short term when they discover the extremely hard work, with little respite, to which they are committed.

The School Division while still not able to keep pace with the demands made on it, has been able to increase its volume of work. The reasons for these are given in the appropriate section of the report. Any neglect of the school child may not be immediately apparent but it will appear in the health of the adult population in a few years' time. The need for expanding this service is becoming more and more apparent as the years pass.

The B.C.G. vaccination campaign initiated in June 1951, was continued through the year, and to date, of the 90,483 children, school children and young mothers tested, 33,167 have been inoculated with B.C.G. The number refusing such inoculation was under 1 per cent.

The scheme for the mass immunisation of Singapore against small-pox was put in hand in August 1952 as a campaign to urge the public to submit voluntarily to vaccination. The result was most gratifying, more than 70 per cent of the population being vaccinated. Public response to diphtheria immunisation while improving has not been as satisfactory. A fuller account of this procedure will be found in the following chapter.

Chief Health Officer: Dr. M. Doraisingham, L.M.S. (Singapore), D.P.H. (London).

CHAPTER SIX

INFECTIOUS DISEASE IN RURAL SINGAPORE

SINCE THE epidemic of small-pox which prevailed from May 1946 to March 1947, contributing 152 cases with 42 deaths, and a further 5 cases in 1948, Singapore has not witnessed any quarantinable infectious disease, *viz.*: small-pox, plague, cholera, typhus, yellow fever or relapsing fever, in spite of the contiguity of territories in which many of these dangerous infectious diseases are either endemic or epidemic, and from which arrivals under quarantine observation were found to be suffering from variola major. Endemicity however exists in respect of diphtheria, chicken-pox, measles and whooping-cough. Diseases whose spread and prevalence are favoured by overcrowding are on the increase. This is particularly the case with diphtheria, chicken-pox and measles.

POLIOMYELITIS

Although 50 cases of acute anterior poliomyelitis were reported during the year only 17 were from the rural area. A fairly comprehensive discussion of the local history and epidemiology of this disease has been recorded in the report for the year 1951, but certain of its salient features which may possibly have a bearing in the coming year may be summarised.

So far nothing has been found which can indicate its method of spread. Investigations have shown that it can prevail in epidemic or endemic state irrespective of variations in the temperature or the rainfall. Nor can any association be found between conditions which encourage respiratory spread on the one hand and conditions which favour general bad sanitation on the other.

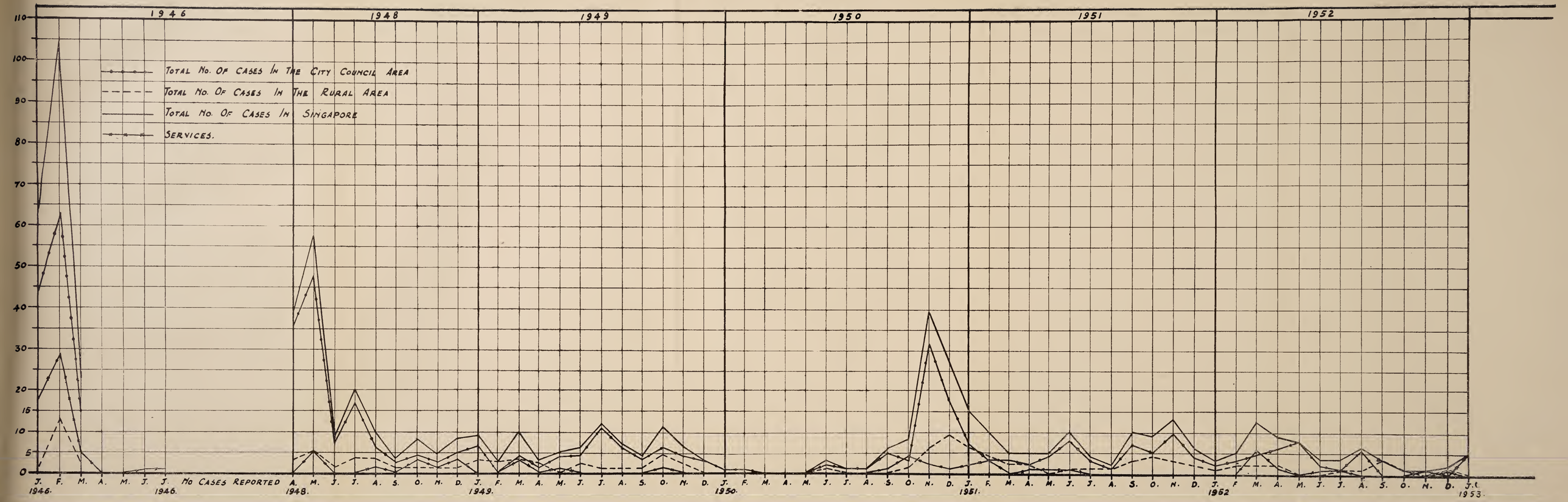
The disease has become noticeably endemic and its total eradication must await a clearer appreciation of its methods of spread. A cyclical periodicity varying from 28 to 30 months is suggested by the graph for the period January 1946 to December 1951. The first recorded epidemic peak occurred in February 1946, and the second in May 1948, after a lapse of some 28 months. The third epidemic peak showed itself in November 1950, 30 months later. A further feature is that while there was not a single case notified from April 1946 to April 1948, the second recorded inter-epidemic period was distinguished by the occurrence of cases throughout except for the months of March, April and May 1950. The total absence of any case during the first inter-epidemic period would also suggest that the second epidemic might have arisen by the introduction of a different strain which has now established itself in the Colony. If this be the case it would be too premature to talk of cyclical periodicity since we may now be observing only the first phase of the new strain.

The post-war years have witnessed an important change in the age-structure of the population which has now become very much younger. The fact that more than 60 per cent of polio cases occurred in children under the age of 10 years may partly explain the endemic state of the disease in the Colony.

It is known that *Japanese 'B' virus encephalitis* is also endemic in the Colony. To what extent the number of cases of poliomyelitis have been artificially increased by the non-detection of virus encephalitis of one form or another it is impossible to assess at the moment.

Fig. 8

ANTERIOR POLIOMYELITIS IN SINGAPORE (JAN. 1946 – JAN. 1953)



VACCINATION CAMPAIGN AGAINST SMALL-POX

The seriously under-vaccinated state of the population of the Colony received attention in the 1951 Annual Report. Following representations from the Public Health Conference a campaign to cover the whole territory on a voluntary basis was initiated in August 1952. Apart from primary vaccination of the new born and re-vaccination of school children no large scale vaccination campaign has been carried out in Singapore since 1946/early 1947 when an epidemic of small-pox resulted in some 152 cases and 42 deaths and led to 275,000 being compulsorily protected. These cases and deaths with the consequent fear raised at that time made that procedure an easy matter although it took some eleven months to accomplish. A compulsory vaccination campaign had been carried out by the Japanese Occupation Authorities but it was suspected with reason that this was largely ineffective owing to very doubtful storage and technique. Thus by 1952 five years had passed resulting in what observation indicated was a largely unprotected population of over one million.

Positive action was started on 20th August, 1952 after a 15-day campaign by press, radio, hoardings, posters, pamphlets and mobile broadcasts had been carried out. The Government and City Health authorities and the Public Relations Secretariat co-operated in the fullest sense. Five centres were established for the purpose in the City area and eleven in the Rural Districts apart from a concentration by travelling and floating dispensaries. Staff was grouped for the purpose, and the centres and facilities made available were widely and continuously advertised to the public. An instantaneous success was achieved with some 500,000 vaccinations performed in the first 40 days of the campaign. It is estimated that by the end of the year, that is to say within a period of some four months, this figure will be 600,000. As all children receive primary vaccination during the first few months of life instructions were given that children under three years of age were not to be re-vaccinated. So some 100,000 of these can be added to the total. Over 17,000 persons received inoculation certificates during the period. While vaccinations by private practitioners and doctors to firms cannot be accurately totalled it is thought that these now total some 30,000 (i.e. Shell Company has done 3,000 for instance). Thus approximately 750,000 persons in the Colony can be said to be well vaccinated today.

The vaccine was provided by the Institute for Medical Research, Kuala Lumpur, and proved to be a particularly potent and satisfactory material. Many cases which had been claimed previously as immune and 'non-taking' were observed to record a strong reaction. While a large number of severe arm reactions were seen no untoward results were observed although people were warned to report to clinics or hospitals if necessary. No dressings were used. No generalised infection or generalised vaccinia cases were encountered and no post vaccinal encephalomyelitis was reported although four severe cases of chicken-pox came to notice as reported small-pox or generalised vaccinia.

It is suggested that this campaign has been one of the most successful ever undertaken in an Eastern country on a *purely voluntary basis outside an epidemic manifestation.* The campaign particularly stressed the vital importance of *visual propaganda* and the necessity of careful and co-ordinated planning in any such procedure.

DIPHTHERIA

There can be little doubt that diphtheria is on the increase as the following distribution for the Rural Area shows:—

Year	*Cases*	*Morbidity rate per thousand*
1949	47	0.17
1950	49	0.2
1951	90	0.3
1952	111	0.36

In the Colony itself there were altogether 427 cases against the 469 that occurred in 1951.

While in the past diphtheria has been regarded as a disease of little importance in rural Singapore the rapid increase in its incidence no longer justifies this complacency. Immunisation against diphtheria has been offered in both City and Rural Maternity and Child Welfare Clinics for some years, but so far only about 25 per cent of the children born have been so protected. The difficulties of health education amongst a people whose traditional ideas and beliefs are backed by age-old custom, and the necessity for two inoculations to secure the immunisation required, are the main factors in the poor immunisation rate so far recorded. Various methods of more active propaganda are being devised, but it is doubtful to what extent we shall be able to break down prejudice and induce parents to bring their children to the clinics for this purpose for some time to come.

Both in the City and in the Rural Area overcrowding is intense. This is further aggravated by the habits of certain communities, particularly the Chinese, amongst whom there is a tendency to live in overcrowded bedrooms even when there is more ample accommodation. The cumulative effect is to increase the carrier rate in the population.

TROPICAL TYPHUS

Five cases of tropical typhus were reported from the rural districts during the year as against 13 in 1951, and 10 in 1949. There is some doubt as to where these cases originated. In those unfortunate individuals who contract this disease there is invariably a history of their having been in established endemic centres in the Federation of Malaya. Compared with the mainland of Malaya where a rise in cases of tropical typhus has been noted in recent years, the incidence is very low in Singapore, and as yet there is no incontestable evidence that there are endemic foci in the Colony. Recent advance in methods of treatment have robbed the disease of its terrors. Preventive inoculation so popular a few years ago is not considered to be of value now. That the disease may invite added interest in the future is a possibility, but on the basis of present experience this contingency seems to be remote.

CHICKEN-POX

There was a slightly reduced incidence of chicken-pox in the rural areas during the year. Compared with 1951, when 186 cases were reported, there were 128 cases in 1952. This disease maintains its nuisance value as each case reported rouses the fear that small-pox has at last gained entry from the ring of infected countries by which Singapore is surrounded. Immediate investigation and careful diagnosis is required in every case in consequence.

ENTERIC FEVER

Enteric fever was evident in 24 persons in the rural area. The rarity of infections from this group of organism locally is surprising. Although the incidence is small the disease follows the usual monthly distribution in Malaya and occurs during the seasons of heavier rainfall. This is what would be expected with a water-borne disease. Flies tend to be more numerous when the soil is damp and the surface collections of refuse are moist.

The commonly accepted theory that all typhoid fever is caused by hawkers may not always be correct and may well lead to the ignoring of the equally important question of general sanitation and distribution of water supplies. A sudden increase in cases in a definite area or among one section of the population should cause attention to be directed to the discovery of a hawker carrier, or other food source. This, in fact, happened during last year when an outbreak started in December 1951. In March this year, however, a carrier was traced and since then the incidence of this disease has dropped significantly.

LEPROSY

A total of 38 cases of leprosy was notified from the Rural areas during the year, compared with 81 in 1950 and 79 in 1951. The incidence of the disease, however, still remains relatively high. It is possible that the success of treatment so widely reported is bringing out persons suffering from leprosy from hiding in the hope of cure, and that in due course the number of new cases will fall. The health drive in general is certainly now playing its full part in this connection. The problem created by this disease remains a major one in view of the total number to be cared for by the Colony—some fifteen hundred.

CHAPTER SEVEN

HYGIENE AND SANITATION IN THE RURAL AREA

INTRODUCTION

THE RURAL AREA is divided into Sanitary Districts which correspond to the districts in which rural committees have been established. These districts now number seven and each is controlled by a sanitary inspector. The total number of sanitary inspectors available now is fourteen. There is one Chief Sanitary Inspector, two Senior Sanitary Inspectors and eleven Sanitary Inspectors. Of the eleven Sanitary Inspectors one has been put in charge of special inspections, another is engaged on duties connected with inspection of the dead, and yet another has been seconded for duty with the immigration department. This leaves only 8, 7 of whom are district inspectors and the other is the inspector in charge of the "town" gang which looks after the sanitation and hygiene of government property in the City. It can be seen then that the inspectorial staff is fully occupied and is barely able to cope with the growing demand.

The inspectors exercise direct authority in their respective districts, their work falling under the following headings:—

(*a*) anti-malarial control and malaria;
(*b*) sewage and refuse disposal;
(*c*) water supplies;
(*d*) offensive trades;
(*e*) housing;
(*f*) food;
(*g*) infectious diseases.

The checking of mosquito control is covered by a centrally administered squad consisting of six trained technical subordinates which visits all parts of the Rural Area according to a strict roster. This squad also carries out special and surprise check surveys.

The appearance of unauthorised and often insanitary structures is causing considerable alarm as these appear here and there with no consideration for sanitation, drainage or the presence of malarial vectors. Only very recently has an attempt been made to regularize the situation but while this is the correct approach the amount of work which has to be done is so great that it will take a considerable time before improvement becomes appreciable.

Much of the rural activity is concerned with routine such as scavenging and conservancy. It is recognised that a good standard must be maintained in these spheres. Scavenging and conservancy should however function as a separate unit and not be placed as an executive responsibility on the Health Officer. As a result of representations made to the Rural Board, that Board has now approved in principle the formation of a special section which will function as an integral unit of the Health Department but with its own superintendent.

The conflicting interests of good sanitation and need for food production have yet to be solved satisfactorily. The local Chinese farming methods are designed specifically not only to produce food but also to breed millions of flies. Our difficulty lies in the fact that many of these farming communities are contiguous to housing estates and the nuisance created by flies with its potential danger to health needs constant attention.

The Technical Subordinates are now in the happy position of having a new and satisfactory scheme which covers their working conditions.

When it is considered that this department controls one of the largest labour forces on the island the small amount of labour trouble experienced is gratifying. The posting of a Welfare Officer to the division combined with an increase in the basic pay and the cost of living allowance for labourers have been the main reasons for this satisfactory state of affairs.

The district sanitary inspectors have started vegetable gardens for the benefit of the labourers and during the year a considerable quantity of vegetables were issued free to families—a good example of self-help.

Health education and propaganda by visual methods is being built up through the Maternity and Child Welfare Clinics. The St. John Ambulance Brigade co-operates by running rural field canteens—a very useful and valuable addition to the Government work.

MOSQUITO CONTROL AND MALARIA

The Government health division still spends a lot of effort on anti-malarial control. Such control is and must be on an ever increasing scale in view of the rapidly increasing population and its spread into the so-called Rural Area. More and yet more building is inevitable with a consequent increase in malarial risk in such a potentially malarious country as this. The necessity for such vigilance is emphasised by the case of the Windsor Park Estate off Thomson Road. This is a new housing project which attracted infected labourers from outside the Colony. It is situated in an area which is particularly dangerous because of readily exposed seepage. Two cases of new malaria exposed the man-made dangers created through the exposure of an *A. maculatus* breeding ground combined with the introduction of labourers from outside already infected. Only intensive anti-malarial measures in this region prevented a major outbreak.

The time is fast approaching when the rural health division will have to include general anti-mosquito duties in its sphere. This is becoming more and more evident as the complaints about nuisance mosquitoes increase. It is inevitable that such complaints will arise as newer residential areas adjacent to the older kampong or inferior insanitary areas arise. An illustration of this difficulty was provided by Holland Road—a good residential area. Investigation showed that a nearby kampong with vegetable gardeners and stock-rearers was the source of a serious fly and mosquito nuisance. A clash of interests between comfort and food production is inevitable in such cases. This is a recurring problem the solution of which is not apparent as yet.

As in the previous year more permanent and temporary measures were introduced and maintained. There are today more than 115 miles of earth drains, 60 miles of concrete drains and 250 miles of sub-soil drains protecting approximately 69 square miles of intensely malarious country. When permanent work has been completed in an area, oiling ceases; this allows the oiling area to be extended until this in turn is subsoiled; as permanent work progresses oil cost is reduced. Work amounting to 504 miles was completed under temporary ditching and oiling control during the year. Brush oiling is the method in use. Some 53,871 gallons of anti-malarial oil were used with 98 gallons of D.D.T. and 215 gallons of kerosene.

Only 29 cases of malaria were reported from the Rural Area. 27 of these were either imported or relapse cases. Regular periodical spraying of houses with D.D.T. takes place on the islands surrounding Singapore.

Larval Control in Fish Ponds

The need for extending and fostering food production has brought with it an increase in the number of ponds which has to be controlled in dangerous areas. For this purpose D.D.T. bricks are used. The year was distinguished by a reduced prevalence of *A. sundaicus*. The majority of the ponds are brackish water ones capable of affording considerable facilities for the breeding of this species of mosquito.

In addition to the work done by the Government Health Department in rural districts the Services control large sections in and around their property, and a considerable amount of permanent drainage has been done by them. Government advises the Services on these matters. Anti-malarial work carried out by them has had a very beneficial effect on the districts bordering on the lands occupied by the Armed Forces.

Mosquito Surveys

A total of 240 mosquito surveys comprising 191 check surveys in controlled areas and 49 special surveys in uncontrolled areas have been carried out.

Special surveys had also to be carried out in four different parts of the City area, *viz.*:—

1. Government House Domain.
2. Kallang Air Port.
3. Kolam Ayer Passive Defence Headquarters.
4. Mount Pleasant.

In all, 240 surveys with a total of 1,869 collections of mosquito larvæ were made of which 186 were *A. maculatus*, 28 *A. sundaicus*, 2 *A. letifer*, 44 *A. bœzai*, and 14 *A. barbirostris*. A detailed summary of collections and species found follows. Collections of vector species in controlled and uncontrolled areas are as follows:—

Species	*Controlled areas*	*Uncontrolled areas*	*Total*
A. maculatus	64	122	186
A. sundaicus	23	5	28
A. letifer	2	—	2
A. baezai	13	31	44
A. barbirostris ...	12	2	14

The increase in the breeding places of *A. sundaicus* in the controlled areas is mainly due to the creation of fresh fish ponds in tidal swamps, mostly in the Serangoon district, and confined to the areas around Woodbridge Hospital and Tampines Road City Sludge Works.

Shallow hyacinth ponds in large numbers have been dug in many controlled areas and these are responsible for the increase in the number of *A. barbirostris* breeding grounds. Further the ponds create a general mosquito nuisance in many lately built up areas.

Laboratory Work

All the 1,869 collections of larvæ were brought to the laboratory and identified. A proportion were reared out to confirm the larval identifications. A record of vector species for every survey is incorporated on a spot map. Type specimens were preserved and mounted and shown to medical students and to technical subordinates.

SUMMARY OF LARVAL SURVEYS AND SPECIES FOUND FOR THE YEAR 1952

Months	Total surveys	Check surveys	Special surveys	NUMBER OF COLLECTIONS OF ANOPHELES												Others	Total collections
				mac.	kar.	kochi	hyrc.	sund.	baez.	vagus	letifer	sep.	phil.	barb.	aitk.		
January	22	20	2	13	3	66	35	2	12	4	..	1	..	..	..	6	142
February	20	19	1	22	3	64	34	3	1	4	..	..	..	..	..	32	163
March	26	23	3	12	11	93	50	1	4	4	..	..	..	5	..	..	180
April	19	19	..	4	11	71	43	..	2	10	..	..	..	1	..	..	142
May	24	21	3	13	12	60	60	1	9	4	..	..	..	1	2	95	257
June	19	10	9	59	15	57	44	..	..	6	..	..	..	2	2	13	198
July	23	19	4	15	3	80	50	1	..	10	1	..	..	..	..	26	186
August	21	10	11	17	6	47	30	..	..	1	..	..	..	2	2	76	181
September	22	13	9	26	7	58	41	1	1	2	..	..	..	1	1	33	171
October	22	17	5	..	4	26	61	16	14	5	..	3	..	..	..	..	129
November	22	20	2	5	3	49	48	3	1	7	1	..	1	2	..	..	120
December	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	240	191	49	186	78	671	496	28	44	57	2	4	1	14	7	281	1,869

Laboratory Experiments

The following anti-malarial mixtures were tested for toxicity, viscosity, spreading power and permanency of film, and reports were submitted:—

Shell malariol GD:	Shell malariol DF.
Stanvac 2 mn 'B' special ...	Sovacide Py.

Toxicity tests were carried out on Shell Malariol Emulsion and BHC (Gammexane) Dispersible Powder P520.

Field Experiments

Field experiments on larvicides were carried out with the following:—

D.D.T. bricks	Shell malariol GD.
Stanvac 'B' special	Shell malariol emulsion.
BHC (Gammexane) dispersible powder P520.	

Field experiments on larval control in fish ponds by means of D.D.T. bricks have been continued and a report has been submitted.

Residual Spraying

House spraying with BHC (Gammexane) dispersible powder P520 has been continued on the following Islands at an interval of six months:— *P. Sudong, P. Semakau, P. Seking, P. Semulun, P. Seraya* and *Lazarus Island.*

In all the islands as the people know that residual spraying is very effective not only on mosquitoes but also on other insects such as spiders. scorpions, ants, cockroaches, centipedes, etc., they co-operate very well and even make requests for more frequent spraying.

REHABILITATION OF ANTI-MALARIAL WORKS

While new works and extensions proceeded apace with housing and industrial development, the year saw also the completion of the rehabilitation of almost all of the pre-war anti-malarial scheme. But no appreciation of the extent and volume of the rehabilitation work performed can be gained without a knowledge of the anti-malarial measures in existence during the years previous to the outbreak of the war and the degree of damage sustained by permanent systems, both by neglect and by uninformed interference, during the period of the enemy occupation. The anti-malarial measures in existence in December 1941 were as follows:—

BUKIT PANJANG DISTRICT

Anti-Malarial Works

(Area protected—5 square miles)

(*a*) *Permanently drained ravines*

Bukit Panjang.	Chua Chu Kang Quarry.
Chua Chu Kang *A*.	Yew Tee Village.
*Bukit Gombak.	Bata Estate.
Chinese Cemetery.	A.P.C. Woodlands.
Chua Chu Kang *B*.	Sembawang Estate (Woodlands).

(*b*) *Naturalistic work*

Nil.

(*c*) *War Department works*

Tengah Aerodrome.	Kranji Oil Depôt.

(*d*) *Temporary works*

Number of ravines under oiling ...	27
Monthly consumption of oil ...	614 gallons
Approximate length of drain oiled ...	5¾ miles

* Partly done (unfinished).

BUKIT TIMAH DISTRICT

Anti-Malarial Works

(Area protected—7½ square miles)

(*a*) *Permanently drained ravines*

Dairy Farm.
*Hume Pipe.
P.W.D. Quarry.
Hindhede Quarry.
Swiss Club.
Race Course.
Dunearn Road.
Watten Estate.
Jurong Road.
*Jurong Wireless Station Reformatory.
Bukit Timah.
King Albert Park.
Wilby Road.
Third Avenue.
Sixth Avenue.
Garlick Avenue.
Namly Avenue.

(*b*) *Naturalistic work*

Swiss Club Valley.
Dairy Farm.
Chua Eng Say's Quarry.
Hume Pipe.
Jurong 15th mile.

(*c*) *War Department works*

Nil.

(*d*) *Temporary works*

Number of ravines under oiling	...	25
Monthly consumption of oil	...	539 gallons
Approximate length of drain oiled	...	5¼ miles

CHANGI DISTRICT

Anti-Malarial Works

(Area protected—8 square miles)

(*a*) *Permanently drained ravines*

Changi Gaol.
Pulau Tekong.
Tanah Merah Besar.
Beting Kusa.
Telok Paku.
Spink Valley.
Y-Valley.
Fish-pond Valley.
Bee Hoe.
Ayer Gomeroh.
Wing Loong Ravine.
Loyang.

(*b*) *Naturalistic work*

Nil.

(*c*) *War Department works*

Changi Cantonment.
Boom Defence.

(*d*) *Temporary works*

Number of ravines under oiling	...	6
Monthly consumption of oil	...	†270 gallons
Approximate length of drain oiled	...	2½ miles

* Work partly done (unfinished).
† Includes Pulau Tekong.

BEDOK DISTRICT

Anti-Malarial Works

(Area protected—6 square miles)

(*a*) *Permanently drained ravines*

Malay Settlement.
Jalan Eunos.
Parbury Avenue.
East Coast Road 7¼ mile.

(*b*) *Naturalistic work*

Nil.

(*c*) *War Department works*

Nil.

(*d*) *Temporary works*

Number of ravines under oiling	...	24
Monthly consumption of oil	...	640 gallons
Approximate length of drains oiled	...	6 miles

PASIR PANJANG DISTRICT

Anti-Malarial Works

(Area protected—4 square miles)

(*a*) *Permanently drained ravines*

Reformatory.
Opium Factory.
Alexandra Road.
Cornwall Gardens.
Ford Avenue.
Queen Astrid Park.
Normanton Camp.
Alexandra Hospital.
Pulau Bukom Kechil.
Pulau Bukom Besar.

(*b*) *Naturalistic work*

Ulu Pandan Ravine.

(*c*) *War Department works*

Nil.

(*d*) *Temporary works*

Number of ravines under oiling	...	15
Monthly consumption of oil	...	218 gallons
Approximate length of drain oiled	...	2 miles

SEMBAWANG DISTRICT

Anti-Malarial Works

(Area protected—10 square miles)

(*a*) *Permanently drained ravines*

Rifle Range.
West Hill Estate.
Realty Estate.

(*b*) *Naturalistic work*

Island Golf Club.

(*c*) *War Department works*

Naval Base.
Nee Soon Cantonment.
*Sembawang Aerodrome (Khatib).

(*d*) *Temporary works*

Number of ravines under oiling	...	26
Monthly consumption of oil	...	348 gallons
Approximate length of drains oiled	...	3¼ miles

* Partly done (unfinished).

SERANGOON DISTRICT

Anti-Malarial Works

(Area protected—7 square miles)

(*a*) *Permanently drained ravines*

Simon Road.
Mental Hospital.
Evacuee Camp.
Leprosy Settlement.
Serangoon.
Sludge Disposal Works.
Trafalgar Estate.
Paya Lebar Crescent.

(*b*) *Naturalistic work*

Sludge Disposal Works.

(*c*) *War Department works*

Former R.A.F. Station at Seletar—permanent works and oiling.

(*d*) *Temporary works*

Number of ravines under oiling	...	26
Monthly consumption of oil	...	900 gallons
Approximate length of drain oiled	...	$8\frac{1}{2}$ miles

By the end of the year 1941, more than 120 miles of pipe underdrains, 40 miles of open concrete channels some of which are more than 10 feet wide, many miles of stick, and hundreds of yards of stone packed drains, numerous anti-malarial wells, two flumes carried far out into the sea, three large automatic syphon type of sluices and flushes of various other types, and four swimming pools were constructed, and two hydraulic rams were installed. In addition more than 33 miles of earth drains had been made and maintained. The control of *sundaicus* breeding was proceeding satisfactorily. Tidal bunds of considerable length and efficient tidal gates were constructed in Changi. The total area protected by these methods and by temporary measures amounted to approximately 50 square miles.

The extensive felling of rubber trees and timber for food cultivation and other purposes during the enemy occupation had the most disastrous effect on the level of the subsoil water. Existing drainage systems, also, in providing for water control, had taken into account and rightly made allowances for the amount of water consumed by trees in the areas so drained. The consequence was that many of the underdrains were found to be inadequate to cope with the water in the ground.

All over the island the Japanese commenced minor engineering works, most of them resulting in the exposure of seepage water or in the raising of the water table. Wet cuttings, tunnelling, excavations, making of embankments, blocking of streams and natural waterways, road and railway construction without any adequate provision for the outlet of water, and many other similar works were being executed with no thought for water control or their effect on the subsoil water. Seepage outcrops began to appear—in places where previously no mosquito control would have been necessary.

Changi in which very large drainage works were constructed, has undergone extensive topographical alterations. In their attempt to construct an aerodrome there, the Japanese dammed the Changi creek in three places resulting in the prolific breeding of *A. sundaicus*. All anti-malarial works except those around the Changi prison, Ayer Gomoroh, Wing Loong ravine and Loyang and the War Department works in the Changi Cantonment, were obliterated or buried and their outlets covered.

In the Siglap District owing to the admission of sea water into a very large concrete tank and the subsequent blocking of the outlet (all under Japanese supervision) *A. sundaicus* commenced to breed in fairly large numbers and caused distress to the residents around. Also in the district, in a ravine north of the halfway house, *A. maculatus* appeared when the area was appropriated by Japanese armed forces. At Kampong Batak, in the Quarry area, where a number of earth drains were made to facilitate oiling, all evidence of past work had disappeared. The large outlet drain issuing from the Malay Settlement, had become heavily silted due to the damming of the lower end by Japanese occupying Perseverance Estate.

A very wide area of drained land in Trafalgar Estate in the Serangoon District was utilized by enemy military farms and partial damage caused to the drains. Elsewhere in the same district big concrete outlet channels had become silted to so great a depth that silt removal was more in the nature of a new excavation than ordinary routine work. The impeded rate of discharge, consequent on the silting up of outlets, also reacted deleteriously on the subsoil drains emptying into them, and expensive repairs were rendered necessary. In this district also are more than 150 salt water fish ponds of various sizes and shapes at Upper Serangoon, Kampong Teban, Ponggol and Yio Chu Kang all of which are now potential breeding places.

Bukit Panjang suffered severely. Nearly all the drainage lines in and around the Shell oil tanks at Woodlands were badly choked or broken. The naturalistic works at Marseling were apparently demolished. In Teck Chye Terrace situated within half a mile of Bukit Panjang Village numerous breeding places were created by earth works. At Bulim, in Chua Chu Kang, there existed a fairly large drained land, the discharge eventually reaching the Straits of Johore via a creek. Across this creek was constructed a large bund for *Ambai* (prawn) fishing. The result was to create a dam that ruined most of the subsoil lines and deposited a considerable quantity of silt in a very wide open channel. The drainage systems at Yew Tee Village, the Chinese Cemetery, Sembawang Estate Woodlands, Chua Chu Kang A and B, Bata Estate, Bukit Gomban, and Chu Kang Quarry all sustained injury.

In Bukit Timah the works at the Hindhede Quarry, the Sixth Avenue, the Third Avenue, Namly Avenue, Jurong, the Swiss Club, the Hume Pipe, and the P.W.D. Quarry were blocked in many places while practically all the naturalistic systems were found to be absent except for three automatic syphon sluices which were all out of order, largely through the accumulation of silt.

At Ayer Rajah Road, in the Pasir Panjang District, a very large system of anti-malarial drainage, radiating from the oil tanks and Normanton Camp, was, in the battle for Singapore severely damaged by a fire that raged for many days in these drains. That part of the open masonry drains and subsoil lines should be functioning to this day presents a testimony to the quality of the work performed. Adjoining this area adjacent to the Alexandra Hospital was another large piece of subsoil drained land. This at the liberation was a knee deep swamp with many ponds here and there.

The exportation of labourers to Siam and Burma depleted a large number of skilled men who had been engaged in anti-malarial work for a number of years. In addition supplies of changkols (hoes) rakes, baskets, brushes, oil sprayers, cement, bricks, shovels, anti-malarial oil, etc. had become extremely short.

From the point of view of malaria control the conditions prevailing at the liberation were in many respects worse than those that the newly created

Government Health Department had to face in 1920. In those days there did not exist a vastly increased and congested population constantly subjected to the bites of carrier mosquitoes, the consequence of extensive disturbances of the earth, the shortage of labour and materials, the probable introduction of new strains of malarial parasite, the certain addition to the indigenous population of a large number of non-immunes; and the poverty, misery, destitution, homelessness and undernourishment incidental to the Occupation also played their evil parts.

The maintenance of anti-malarial drainage works constructed in War Department lands were, after the war, handed over to the respective Services Authorities and these have now gradually been restored to their pre-war state except for the heavily damaged systems around Normanton Camp.

Major repairs and reconstructions were carried out at Chua Chu Kang A and B, Bukit Panjang, Yew Tee, the Chinese Cemetery, Bata Estate, Bukit Gombak, the Chua Chu Kang Quarry, Chek Wye Estate and Woodlands in the Bukit Panjang District, the Hindhede Quarry, the Sixth Avenue, the Third Avenue, Namly Avenue, Swiss Club, Jurong, the Hume Pipe, the P.W.D. Quarry and the Dairy Farm in the Bukit Timah District and the former Opium Packing Plant in the Pasir Panjang District. There yet remain three large systems which need repairs, in Chek Wye Estate, at Woodlands in the Bukit Panjang District, and in the Dairy Farm in the Bukit Timah District.

The rehabilitation of the Experimental Ravine in the Swiss Club in the Bukit Timah District with naturalistic methods of mosquito control has been put in hand on a much reduced scale owing to housing development in this area.

SEWAGE AND REFUSE DISPOSAL

Scavenging

As in previous years this is still performed by the Government Health Division aided by the contractor system through the Rural Board. The same methods were continued for ultimate disposal; incineration and burying. As far as is practicable the residue is used to make up land which otherwise is of no value or may even give rise to nuisance. It is hoped that a new cleansing unit will soon function as an independent section under the Rural Board. This will enable more thorough and more extensive scavenging operations to be performed throughout the rural areas. Mechanisation and other modern equipment will enhance the sanitation of the area and may possibly curtail the over-all expenditure in this sphere.

Conservancy

The contractor system through the Rural Board still occupies the main place in this respect. Its failings have been noted in past reports and no useful purpose is served by reiterating them. Here again the new 'cleansing section' should help to put this type of environmental health work on a more sanitary footing. A departmental system with night-soil lorries in the Bukit Timah and Bukit Panjang districts was a start in the right direction and will provide many lessons from which the new section can learn. As yet there has been no extension of the City sewerage system to the rural areas. Such an extension in the near future to the more built up sections is inevitable. Meanwhile septic tanks are asked for, especially where large factories particularly those concerned with food production, and large housing estates, are coming into being. It should be noted that these septic tanks after approval and assessment are

supervised and maintained by the Health Division. The numbers of such installations have increased considerably and this has necessitated an increase of staff for this work. During the year more fitters were engaged so that the rural area could be divided into manageable regions where a fitter and two labourers could operate. To assist the public health supervision in this over-all management a sanitary inspector was seconded to this work.

An ever increasing use is being made by householders of the various types of chemical closets. All applications are considered on their merits. Encouragement is given to such installations where more satisfactory sanitary arrangements are not possible or practical.

WATER SUPPLY

A noticeable extension of piped water supply to the rural areas has taken place during the year. In particular areas adjacent to main roads now have such piped water. Unfortunately kampong dwellers are still supplied in the main by shallow wells. Wherever possible anti-malarial measures are combined with the supply of a more satisfactory water through anti-malarial wells. Standpipes are provided wherever the needs appear to be great and there are no major obstacles to such provision. The over-all need in the supply of water to rural dwellers would appear to be the establishment of a public utility water supply system. Then actual requirements could be properly assessed and water provision systematically planned.

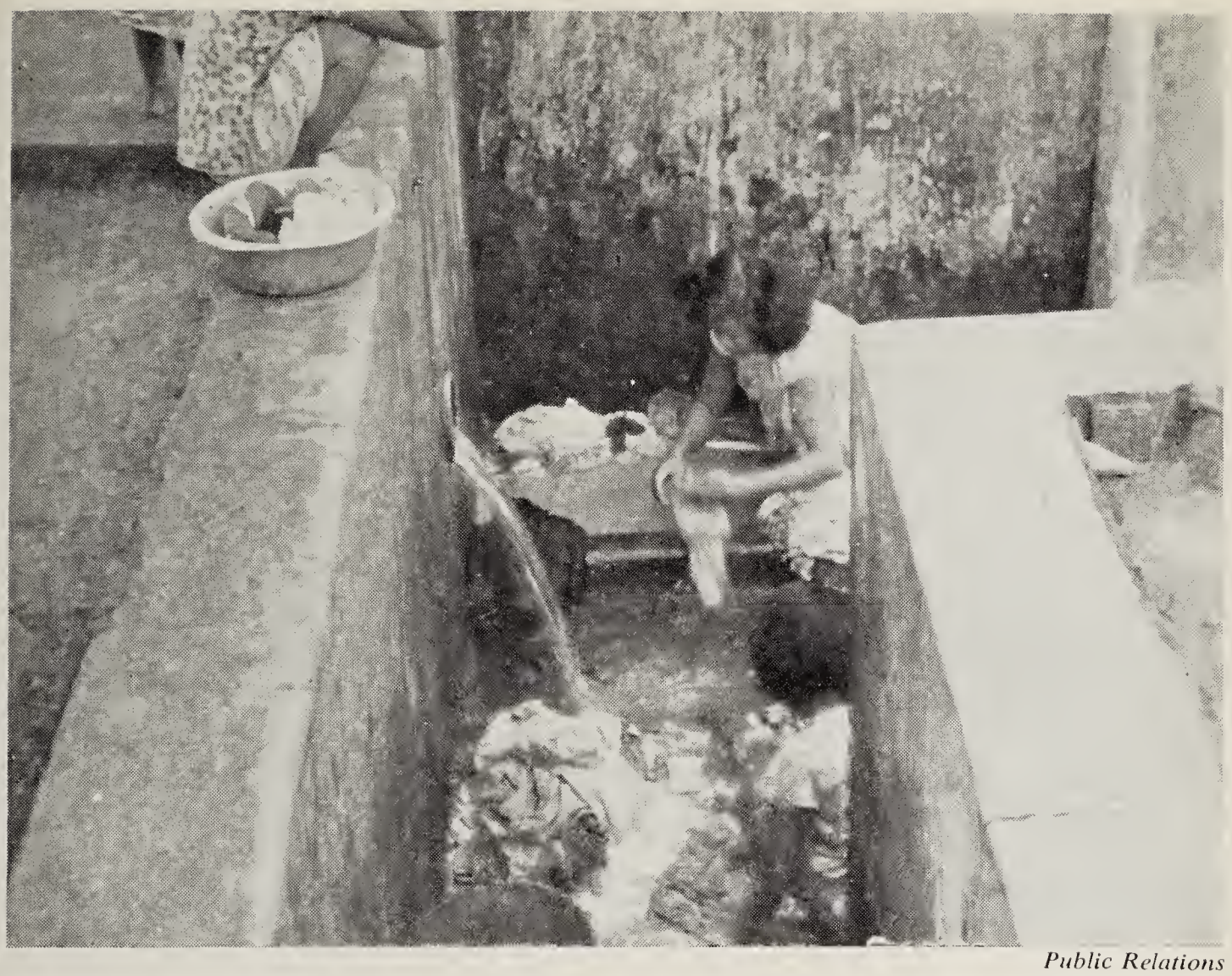
OFFENSIVE TRADES

The drop in rubber prices has had an effect in that a number of rubber factories and smokehouses have had either to curtail their activities very much or to close down. The Rural Board very properly zoned off certain areas where these trades could not be conducted. Both for the purposes of controlling offensive trades, and of factories and housing generally, the Rural Board has a Zoning Committee which meets regularly and considers all applications. The Chief Health Officer sits on this Committee.

The Health Division liaises closely with the Government analysts of the Department of Chemistry so that all necessary health precautions are ensured when any offensive or dangerous trade is contemplated. Advice is given to the industrial managements concerned.

Rubber processing is now being overshadowed in offensive trades by the introduction of many other undertakings such as foundries, soap making, industrial gas production and so on. The industrialisation occurring in the Rural Area will soon require more up-to-date legislation than the present, and this will mean that a sanitary inspector will have to be found for the supervision of such places.

A special survey was carried out on dairies and cattle-sheds throughout the Rural Area. These work mostly on a small scale but some are quite large as far as the number of beasts are concerned. None are in a very sanitary state. They have always been a problem but this has increased through expulsion measures from the City Area. With few exceptions no piped water supply exists. The methods of conducting business and the type of person engaged in these trades present grave risks to the public health even where the buildings may be considered as coming near to minimum requirements. Pasturing of the herds is carried out haphazardly and milk transport is on a most primitive footing. Some proper future policy will have to be devised in



Public Relations

Anti-Malarial Works constructed with a view to providing a village with water supply

Public Relations

Anti-Malarial Works—Brush Oiling

Public Relations

Anti-Malarial Works—Subsoil Drainage in course of construction

Public Relations

Anti-Malarial Works—Subsoil Drain with Wash Well

this connection possibly on a co-operative system, with one or two large cattle-sheds or dairy farms built with due regard for health, and hygienically conducted. Safe water supplies and adequate supervision by the Veterinary and Health Departments will have to be insisted on.

Number of Inspections

Cowsheds	3,177
Piggeries	6,250
Poultry Pens	491
Rubber Factories	1,735
Copra Sheds	172
Potteries	216
Soap Factories	832
Other Inspections	2,932

HOUSING

Housing still presents a serious health problem firstly because the supply cannot satisfy the demand and secondly because most of the large housing developments taking place do not provide accommodation which is within the purse of the really poor. In consequence in most instances the latter is left to his own devices and is forced to erect sub-standard dwellings without authority. In the Bedok-Changi area an experiment was carried out with various types of materials by erecting low cost houses which might help to solve the problem. Land utilisation in the rural areas requires that more must be built on a smaller area than previously and this means higher buildings instead of smaller numbers over a wider area.

'Lock-up' shops are no longer being encouraged. The policy now is to insist on a two-storey building so that the shop is on the ground floor with domestic accommodation above.

Housing has got to be tackled by over-all planning of villages and open spaces. Then the individual layouts must be made to conform with the general plan for the Rural Area. Roads must be satisfactorily provided and adequate drainage outlets established so that houses when built can be provided with the necessary utilities, sanitary drainage, and facilities for scavenging and conservancy.

Unfortunately Singapore is to a large extent a 'cubicle' Colony with many families housed in one-roomed, partitioned spaces carved out of back areas of shops. This leads to a dense population in restricted areas even in the rural districts. The great problem now is how best to relieve overcrowding and yet remove this relic of past decades which cannot fail to favour ill-health.

Special inspections were paid to 24,738 premises.

FOOD IN RELATION TO HEALTH AND DISEASE

The supervision of food in order to maintain good health standards continues. It is handicapped, however, by the multiplicity of duties which sanitary inspectors have to cover. Generally it amounts to action being taken on the receipt of specific complaints rather than any system of organized and regular inspections, together with the taking of samples and subsequent analyses. It is hoped to delegate one inspector for specific duties in this connection in the near future.

It has been realised for some time that our existing legislation in connection with food control requires a more modern approach with more specific and positive definition. So during the year a select committee has been busy revising and amending the Food and Drugs Ordinance and Regulations for this purpose. The results of this deliberation will soon be incorporated in new legislation.

The tendency is towards more and more food factories, and three large modern factories will be canning food in the Rural Areas very shortly. These are the Amoy Canning Company, the Lam Soon Canning Company and a large concern which intends to deal with milk and cream and their by-products.

The meat situation is largely covered by the importation of frozen or chilled carcasses from outside countries but sheep are imported and then slaughtered in the City abattoir. Pork is the difficult problem in this connection as private slaughter houses are not allowed. So officially all pigs from rural Singapore have to be slaughtered under adequate supervision at the City abattoir. Nevertheless large-scale illegal slaughtering continues to take place with serious possible health danger. By Chinese custom pigs are kept by all and sundry, and very few are housed in accordance with the by-laws. Furthermore pigsties are more often than not in out-of-the-way places where insistence on sanitary requirements is fraught with considerable difficulties. It is clear that stricter and selected zoning will have to be the rule with a system of pig registration and prohibition of pig-breeding by those who persist in not maintaining adequate sanitary standards. Permission to transport pigs should be a pre-requisite. Special watch must be maintained over markets and shops where pork is sold, and over hawkers who act as vendors.

The food hawker again looms large in the food picture and its reasonable control. A definite rural policy seems to be arising in this connection. New legislation has been drafted by which control is aimed at by means of prohibition of certain areas where hawking will not be permitted. The local authority is to provide shelters at selected points where hawkers and stall-holders may sell food after being duly licensed. It is hoped in this way to meet the demands of public and hawker in a way compatible with the maintenance of good and healthy food conditions.

Where a large section of the population lives in cubicles with no cooking facilities and is forced to 'eat out', the eating house should meet the demand rather than the street stall. Nevertheless the hawker who carries round supplies of fresh meat, of fish, and of vegetables to districts remote from public markets serves a useful purpose, and is a boon to the busy housewife and mother. Proper containers for carriage should, however, be more widely used.

All food factories and eating houses are inspected by the officers of the Health Division and recommendations follow before licensing. A considerable number of applications has to be refused on the grounds of insanitary premises. Even in cases where the building can be made perfect the sanitary conscience of the workmen, and even of the proprietor, is often primitive. Dirty habits can render the most perfect structure and apparatus ineffectual. True improvement will come when the public refuses to patronise unclean premises. No hawker who prepares his goods in an insanitary hovel, or in the overcrowded kitchen of a shophouse, should properly be considered for a licence.

One Government-managed market continued its successful progress and an additional extension was opened recently. More of these markets are essential. Private markets continued to thrive in the old insanitary way, but continuous supervision kept in check some of the more obviously unhygienic practices. The private markets are commercial ventures and little of the profits are expended on cleansing or proper stalls. The sooner such structures come under public control the better. All markets continue to be the haunt of numbers of unlicensed mangy dogs. As shooting dogs in such areas is impossible, other methods of removal have been suggested by the Board and it is hoped that this nuisance will be eradicated shortly.

The health committee, newly formed by the Rural Board, and the district committees, should soon become important factors in the rural health front. The past year has indicated a very welcome advance in this direction. The district committees are showing a growing realisation of their power as an instrument in good public health.

Food Inspections, 1952

Eating Houses	...	...	...	...	11,528
Coffee Shops	...	...	...	...	3,285
Fishmongers	...	...	...	...	5,907
Grocers	...	...	...	...	6,851
Markets	...	...	...	...	5,584
Milk Vendors	...	...	...	...	2,116
Bake-Houses	...	...	...	...	2,816
Hawkers	...	...	...	...	9,601
			Total	...	47,688

OCCUPATIONAL HEALTH

An outline on occupational health in the Colony of Singapore was given in the 1951 Annual Medical Report and reference should be made to that publication for an appreciation of existing conditions.

During 1952 not much noticeable change can be recorded in regard to conditions in older work-places. A much higher standard has, however, been maintained in new industrial establishments. Due to the efforts of the health division industrialists have been directed to build factories and workshops with full regard for the interests of the health of employees. This is a particularly important advance when the diverse types of industry which continue to appear are considered.

The traditional rubber factory and the smoke house which used to be such an outstanding factor in the local economy are being challenged by many other and newer forms of occupation.

The zoning by the Rural Board of certain areas for industrial purposes is undoubtedly having a beneficial effect on hygiene and sanitation. Nowhere is this more noticeable than in the modern form of 'trading estate', an example of which can be seen close to the Princess Elizabeth housing estate off Bukit Timah Road. Here factories are well-lighted and ventilated, and are supplied with modern canteen facilities and sanitary arrangements. As in other new building areas, particular attention has had to be given to the danger of malaria to ensure that this disease is not introduced by earth disturbances during construction.

Stress is laid, and always has been laid, by the health division on accommodation for workers and their families, on transport facilities, on ventilation, lighting, dust-proofing and other preventive measures, on ablution arrangements, on modern sanitary conveniences and on first-aid equipment in all industrial ventures.

The assessment of health hazards in industry depends for its success on the initial receipt of full details regarding the individual manufacturing processes. Prompt and correct statements aid speedy consultation and consideration by the health authority which always works in close liaison with the Department of Chemistry in this connection. This work as well as liaison with other vitally interested departments should be improved still further when the hoped-for up-to-date factory legislation is in operation.

The intention is to second more sanitary inspectors for work in this particular field as and when staff becomes available.

A special survey was carried out on Christmas and Cocos Islands. This was done in order to assess the state of health in both places. Doctors are employed by private concerns in each territory but their services are available under island arrangements to all the population.

The state of health in both islands may be considered to be good, and sanitary arrangements are adequate for the respective needs of the islanders. On the personal health side, more particularly with relation to immunisation procedures, greater use will have to be made of all tried and tested vaccines and antitoxins. This will be necessary because isolated populations of this type with the greater means of sea and air communication now in use leading to more frequent contact with outside communities are susceptible to greater risks.

In the case of both islands the working population is engaged in one industry. At Cocos there is copra with a Cocos-Malay population involved, whilst at Christmas Island there is open cast mining of mineral salts with a mixed population, mainly Chinese plus a small number of Malays and Cocos-Malays. No specific occupational hazard is noticeable in either case.

CHAPTER EIGHT

MATERNITY AND CHILD WELFARE SERVICE IN THE RURAL AREA

A SERVICE for the care of mothers and infants in the Rural Area of Singapore was commenced in 1927 with the recruitment of a Public Health Matron. Faith in western medicine was mainly confined to the educated classes but even amongst these at that time it was the more daring who would defy the advice of local custom and prejudice. The Malay *bidan,* the *bomoh,* the *dukun,* the Chinese *sinseh,* and the Indian *ayurvedic* and *unani* physicians laid heavy claims in those days on the credulity of a people long accustomed to the influence of supernatural agencies with which only the local medicine man could by devious means successfully contend.

The infant service had therefore to contend with numerous adverse and curious customs and rites to which the ailing mother and the crying infant had to be subjected. The umbilical cord was dressed in cow dung; the new born infant was bathed and dried over a smoky fire at the dead of night; the mother *in puerperium* was ostracised and confined to a dark room so that the visual sensibility of the favoured male might not be offended. The baby, hardly a month old, was fed on chewed rice and ripe banana: the growing girl was encased in deliberately tight fitting clothes which prevented a proper development of physique.

Even in the mind of the most optimistic at that time there was doubt as to the effectiveness of such a service for a long time to come. In consequence, nothing ambitious or comprehensive was contemplated. The Public Health Matron was merely asked to start a service as she thought fit.

A small nursing staff was assembled and informal clinic sessions unassisted by propaganda were started and held at irregular intervals often under canvas hoods in the shade of trees, sometimes in the verandahs of coffee shops, and occasionally in the sitting room of some village personality. Naturally, there was hardly any response until a little later the nursing staff started visiting homes of mothers. From 1929 onwards the trickle then started became a stream which since the reoccupation has become almost a flood.

Started primarily as a spearhead for health education the need for properly staffed static centres was not realized for a long time. In consequence up to the outbreak of war in 1941 only three such centres existed. Provision of proper buildings for the purpose and for the accommodation of the nursing staff is largely a post-war development.

With the completion of two large new Maternity and Child Welfare Centres—one at Holland Road and the other at Nee Soon—and the opening of a residential mid-wife centre on Pulau Ubin, the scope of the service was further expanded during the year. These two new buildings, together with another built in 1949 have been so designed that they can be developed into proper Rural Health Centres when more staff becomes available with doctors, sisters, nurses and sanitary staff. The aim is to provide seven such Rural Health Centres which will be supported by approximately a hundred small clinics dotted over the rural zone and chained to these, some with resident nursing staff and some with resident midwives; only a few will continue to be non-residential visiting centres. When properly developed each

Rural Health Centre will in addition to providing facilities for maternity and child welfare and school medical work, have a small laboratory, a dispensary and specialist services. As far as possible these centres will work in intimate contact with 'Community Centres' so that the large auditorium and the library facilities in the latter can be made available for Health Education.

There are now eleven main centres with resident nursing staff and six with resident midwives only. Twenty-four further centres exist where weekly clinics are held by the staff of the main centres.

1953 will see the addition of two further main Health Centres and a smaller unit on Pulau Tekong Besar Island: 1954 twelve nurse and midwife centres.

Attention was drawn to the increasing help and encouragement given by voluntary effort in the 1951 Medical Annual Report. During the current year the District Committee of the area has commenced to erect a centre at Tuas to serve the needs of some 3,000 local residents. A building put up by the residents of Kampong Loyang near Changi has resulted in a further permanent building where regular sessions can be held instead of using the covered way of the teacher's quarters.

The staffing of this section with two Lady Medical Officers has proved to be of inestimable benefit. Much re-organization, as well as an improvement in the quality of the service has been brought about in consequence. These appointments do not mean an undue emphasis on curative work. Active *preventive* measures are pursued, and the detection and remedy of defects has improved considerably. Also evident during the year was the increase in the number of successful immunisations against diphtheria.

The staff now consists of the following:—

Lady Health Officers	2
Public Health Matrons	2
Supervisor of Midwives	1
Health Sisters	4
Health Nurses	13
Health Midwives	33
Health Servants	21

Early in the new year a district medical officer will be stationed at Changi and later on three others in other rural districts.

Unlike centrally situated institutions in easy proximity to the normal amenities which a large town can and does afford, the sites of the rural maternity and child welfare centres are such that they are unfortunately the reason for discontent. Consequently staffing difficulties are always apparent in such a division. Further, in a section staffed very largely by intelligent and hard working women, resignation through marriage is ever present. This usually means a loss of experience to the department. While the position in regard to the recruitment of midwives has improved, the filling of vacancies by suitably trained Malay midwives still presents considerable difficulty. That there is need for concentrated work amongst Malays is only too true. This section of the community has the highest infant and general mortality rates in the Colony: 120.01 and 14.60 respectively as against 69.97 and 11.20 for all races. It is nevertheless encouraging to note that today there are 22 Malay girls under training at the Kandang Kerbau Hospital.

Details of the work carried out by the staff of the Maternity and Child Welfare section were given in the Medical Annual Refort for 1951. In consequence only a summary follows here.

Maternity Work

Mothers attend the chief centres of the rural service for ante-natal care. They are given a general examination plus an obstetrical examination on their first visit to the doctor. They are then advised where and when to attend regularly. Any abnormalities found are treated and they are supplied with vitamins, iron, and calcium and milk if necessary.

Cases that cannot be treated as out-patients are referred to the Kandang Kerbau Maternity Hospital for admission.

Most of the actual work in the field in the rural area is dealt with by Government midwives, as very few private midwives practise outside the town except in the Upper Serangoon, Lorong Tai Seng and Yio Chu Kang areas. A total of 8,917 confinements were attended by our midwives during the year compared to 5,235 by private midwives. Out of a total of 14,641 births, 489 cases were sent to hospital. Owing to the location of many squatters' huts and deficiency of proper roads and transport, it will be obvious that a proportion of babies must continue to be born before the actual arrival of the midwife. Following the birth, the midwife visits daily, nursing the mother and bathing the baby for an average of one week. Action is taken to visit all babies born in rural districts.

The Health Nurses pay a routine visit to the patients' homes once during the puerperium to see and give advice to all mothers. If there is any abnormality the doctor is informed and she will if necessary attend to the case herself at the patient's home.

When the baby is 40 days old the mother brings the baby to the clinic for infant welfare care. At the moment no routine post-natal examinations are given to all mothers, but any mother who complains is examined and treated by the doctor.

There were 12,450 first antenatal visits and 19,083 re-visits to the clinics with 42,310 nursing visits by midwives to mothers and infants. 23,250 homes were visited by the health nurses.

Infant Welfare Work

Mothers are advised to bring their babies regularly to the clinics. Here they are taught how to feed, to clothe, to educate and to bring up their babies properly. Some are still very unco-operative, often doing the opposite of what is advised: others continue to regard the centres as out-patient departments, bringing their babies only when they are seriously ill. Thus a certain amount of treatment is carried out in all the centres. Common ailments are cough, cold, fever, diarrhœa, worm infestation, otorrhœa, anæmia, undernourishment due to improper feeding, and scabies and other skin infection (chiefly due to secondary infection of mosquito bites or ant bites and uncleanliness).

A total of 1,981 sessions were held at the various clinics. 96,274 infants under one year and 46,828 children from one to five years were seen.

Prophylactic work is carried out at the clinics against small-pox, diphtheria and tuberculosis.

Vaccination against Small-pox

All babies are vaccinated at the age of 4 months to 6 months and 11,951 primary vaccinations were carried out.

During the last five months of the year a vaccination campaign was introduced on a large scale in an attempt to vaccinate all the rural population as a part of a Colony wide project. Some 70 per cent of the nearly 1,100,000 people were dealt with successfully without any serious untoward results.

Diphtheria Immunization

During the year 8,914 children from eight months to five years were immunized, but only 6,075 cases had the complete course of two doses as against 3,360 in 1951. 11,866 children have been fully immunized under the campaign so far.

Tuberculin Testings and B.C.G. Vaccinations

Tuberculin testing and B.C.G. vaccinations were continued during the year and up-to-date the following figures apply to the rural areas and the Maternity Hospital:—

Total number of children and mothers tested (Moro—1,033. Mantoux—552)	1,585
Moro positive 87. Moro negative 810. Moro Absent 69. Moro doubtful 67	1,033
Mantoux positive 330. Mantoux negative 182. Mantoux Absent 40	552
B.C.G. given to Moro and Mantoux	971
B.C.G. given to newborn infants	313
Total number of B.C.G. given ...	1,284

Free milk is supplied to all undernourished babies and mothers. The following table gives a resumé of the 1952 work in this respect:—

(*a*) Homes visited—	
(i) Nurses	23,250
(ii) Midwives	46,735
(*b*) Cases seen at home	59,139
(*c*) Nursing visits by midwives	43,310
(*d*) Confinements attended	8,917
(*e*) Mothers in labour sent to hospital	489
(*f*) Clinics—	
(i) Infants	96,274
(ii) Children over one year	46,828
(iii) Ante-natal mothers	31,535
(iv) Post-natal mothers	13,389
(v) Primary vaccinations	11,951

Free Milk Distribution:

(*a*) Number of feeds to mothers	98,668
(*b*) Number of feeds to children	680,052
(*c*) Powdered Milk used (in pounds)	26,639

Vital Statistics for the Rural Area of the Colony of Singapore:

1.	Population (mid-year)	305,795
2.	Death rate	8.8 per mille
3.	Birth rate	47.8 per mille
4.	Still birth rate	12.7 per mille of births
5.	Infant mortality rate	55.9 per mille live births
6.	Maternal mortality rate ...	1.2
7.	Neo-Natal mortality rate ...	20.5

CHAPTER NINE

FLOATING, TRAVELLING AND STATIC DISPENSARIES IN THE RURAL AREA

THERE ARE today in the Rural Area one launch dispensary, four motor travelling dispensaries and three static dispensaries. During the latter part of the year an additional travelling dispensary was acquired and steps were also taken to obtain a second launch to meet the health services to the islands. It is hoped that in due course the travelling dispensaries will be able to curtail visits to the relatively distant but comparatively heavily built up areas by the provision of extra static dispensaries in these with the placing of doctors to man them. The scope of the travelling dispensaries will then be widened; new itineraries can be planned and still wider contact made with the more distant parts of the rural districts. The absence of better road communication is a factor which naturally limits the usefulness of this service.

The floating dispensary which was specifically provided to maintain good contract with the more isolated sections of the population, such as those residing on the small islands and on the western inaccessible coastal area of Singapore has done extremely good work during the year. It is unable to cope with all the needs which exist, however, and the provision of the second launch will certainly relieve the pressure that we are meeting with at the moment. The absence of wharfs and suitable jetty facilities consumes much time as a dinghy or the sampan has to go to and from the launch.

During the year 52,573 attendances were recorded by these moving dispensaries. Of these 36,498 were new cases.

There are three static dispensaries at Bukit Timah, Paya Lebar and Pulau Brani. The Paya Lebar clinic is situated just within the City area but it serves a thickly populated section outside this limit in addition. Part of the dispensary building at Bukit Timah is used as a Maternity and Child Welfare clinic and the Paya Lebar dispensary is also used for similar and school clinic sessions. 39,796 attendances were recorded and of these 17,818 were new cases.

Another new departure is the rural travelling venereal diseases dispensary clinic. While venereal disease is specially treated at the clinics of the Social Hygiene Division in the City, this additional service is paying dividends as a reference to Chapter 19 will clearly indicate. Certainly it is not desirable to use Maternity and Child Welfare centres as venereal disease clinics in the strict sense of the term. Nevertheless it is quite proper that such cases from amongst the normal attendances should receive proper advice and attention as a routine measure of ante-natal control.

CHAPTER TEN

PORT HEALTH AND QUARANTINE

THE LIFTING of the Indonesian ports from the list of gazetted infected ports and the granting of exemption to troop ships from anchoring at the quarantine anchorage for medical inspection are reflected in the smaller number of vessels and passengers examined at the quarantine anchorage for the year. Only 1,469 ships with 43,677 landing passengers were examined this year as against 1,979 ships with 86,623 passengers in 1951.

As from the 1st March, 1952 a fee of $1 each for vaccination against small-pox and inoculation against cholera and $10 for inoculation against yellow fever have been levied and this is bringing in a substantial revenue to Government.

No cases of quarantinable diseases were imported into the Colony during the year.

All passengers making the pilgrimage to the Hedjaz were medically examined to eliminate those physically unfit for the mission. As a result of this the mortality rate amongst the pilgrims was very low.

The Government Health Department moved out of the Fullerton Building to Palmer Road in December. The Port Health Office has remained in the former premises, however, as a matter of public convenience. The following is a summary of the work carried out:—

	1951	*1952*
Number of ships inspected and cleared	1,979	1,469
Tonnage (nett)	5,650,059	5,230,812
Number of passengers inspected on ships at the Quarantine Anchorage:		
(*a*) landing	86,623	43,677
(*b*) in transit	50,948	43,127
Number of passengers quarantined on St. John's Island	28,320	26,314
Number of Bills of Health issued	9,080	7,411
Number of ships issued with fumigation certificate	90	112
Number of ships issued with deratization exemption certificates	291	281
Number of rats destroyed during fumigation and examined bacteriologically:		
(*a*) destroyed	696	1,163
(*b*) examined	189	74
Vessels visited to inspect corpses	18	14
Permits issued to import, export or tranship coffins containing remains	78	208
Pilgrims' ships with pilgrims:		
(*a*) ships	3	3
(*b*) pilgrims	2,121	2,351
Certificate to accompany goods	386	313
Disinfection of infected vessels	1	Nil
Inspection of Bum Boats	129	101
Inspection of Water Boats	10	13
Vaccinations and inoculations performed at the North Canal Road Dispensary:		
(*a*) small-pox vaccinations	11,942	10,294
(*b*) cholera inoculations	14,843	11,342
(*c*) T.A.B. inoculations	164	128
Free booklets issued ...		271

The total number of passengers admitted during the year amounted to 28,320.

Their racial distribution was as follows:—

	1951	*1952*
Chinese	14,520	5,591
Indians	12,813	19,927
Malays and Indonesians	908	739
Others	79	57

CHAPTER ELEVEN

AIR HEALTH

THE STEADY increase in the volume of air traffic arriving and leaving Singapore was not maintained during the year, largely because air companies deliberately curtailed flights during the period of aviation petrol shortage. The numbers are, however, increasing rapidly again. Aircraft arriving from infected or suspected ports totalled 1,230 compared with 2,023 in 1951. With a twenty-four hour service in operation 35,028 passengers and crew were inspected by two full-time Medical Officers. Even in the case of air passengers, who might be expected to have been better instructed in international health requirements, 510 had to be put under surveillance for the non-possession of valid certificates of immunization.

The present airport buildings are not designed to cope with the increased volume of traffic, and plans for alterations to meet the present conditions have now been finalised. One of the main difficulties has been to ensure that medical inspection is carried out before passengers contact their friends or the Press. Many claim V.I.P. status; this privilege is now accorded to very few persons, and a room has been set aside where the public and the Press can interview or contact such persons after a full medical inspection.

The Airport Health Officer also interests himself in the general sanitation of the airport area, but particular attention to the elimination of breeding places of the *Aedes mosquitæ*, the carrier of yellow fever, has not been possible so far owing to the proximity of overcrowded slum areas. The accidental infiltration of yellow fever may well become a real dread and one against which the Health Authority may have to be constantly on the watch. At present Malaya is protected by the buffer of India, but the possibility of a direct route from Africa to Australia with a stopping place on an island in the Indian Ocean, with a branch route to Singapore, brings the danger ever nearer.

Reservations have been made by the Colony against the new International Sanitary Regulations in Quarantine first adopted by the Fourth World Health Assembly in June 1951. These regulations have laid down certain minimum requirements which have to be met if Singapore is declared a yellow fever receptive area. The Civil Aerodrome at Kallang is so situated that *ædes ægypti* control is well nigh impossible without incurring extraordinarily heavy expenditure.

A new international airport is under construction at Paya Lebar and it is hoped that when this aerodrome comes into being it will satisfy all the requirements of Article 20 of the International Sanitary Regulations, World Health Organization No. 2.

CHAPTER TWELVE

THE ISLANDS

BEGINNING a service in 1951, the new floating dispensary visited all the inhabited islands, including Pulau Ubin and Pulau Tekong, once every week except for two which lie in the Straits of Johore. The latter were visited monthly. In addition the launch maintained a regular transport for maternity and child welfare and other health staff which was cut off from other approach, and for equipment replenishment for these places. Medical and Health Officers also visit Pulau Tekong Besar and Pulau Ubin weekly and other islands less frequently. So much greater attention has been possible in matters of anti-malarial control and general sanitation as well as in maternity and child welfare than in any past year.

Pulau Tekong Besar and Pulau Ubin lying to the east of the Colony are the largest of the islands surrounding Singapore. The former has a resident population of some 2,822, of whom more than half are Chinese, the rest being Malays. The majority of these people are congregated in three village groups, the kampongs of Selabin, Pahang and Pasir. One Chinese and two Malay schools operate on this island. It has a resident midwife employed by the Governnment. General sanitation and anti-malarial control are under the direct supervision of a resident technical subordinate of long service. Weekly clinics are held by visiting doctors of the Health Branch. Plans have been approved for the construction of a main maternity and child welfare centre cum dispensary, and the building will be ready for occupation during 1953. Pulau Ubin, the second largest island, has a population of 1,456 of whom the majority are Chinese. The Health Branch maintains a scavenging and anti-malarial gang, and weekly clinic sessions are held by the staff of the maternity and child welfare centre. Doctors visit frequently. A subsidiary centre was opened in 1952. Health on these islands has been very good indeed.

The two groups of small islands lying off the South West Coast of Singapore belong to a world apart. Some are merely detached portions of the mainland; others are coral reefs covered with sand. In the outer group the most heavily populated are coral banks; the larger islands have few inhabitants. The people are almost entirely Malay fishermen and their families, and being fishermen, the nature of approach to land has been the principal determining factor in their choosing certain islands as places suitable for residence. The populated islands have beaches which can be reached from the sea at all states of the tide. Pulau Sudong for example, with its beaches giving easy access to the sea, is one of the smallest, but for its size it is a heavily populated island. Pawai and Senang are much more difficult to reach and malarious owing to the nature of the ground. At any rate Pawai is supposed to be haunted by ghosts which in the long run are said to kill off all who attempt to settle there. Unless the landing can be improved it is doubtful if an attempt to lay the 'ghost' would be profitable. Dangerous mosquitoes are obviously invading Pulau Sudong from somewhere, most probably from Pawai. Nevertheless the Pawai population suddenly increased towards the end of the year and so centralized control had to be instituted.

WELFARE ON PRINCIPAL ISLANDS IN THE VICINITY OF SINGAPORE

Name of Island	Population at 1952 Census	Schools	Infant Welfare and Maternity Clinic	Medical Dispensary	Anti-Malarial Work	Water Supply	Ketua
Mukim XXXIV: Penghulu: Awang Chik bin Gomo							
Pulau Seraya	(approximately 260 —1952)	School erected by people of the island. Teacher paid by Government.	Weekly visit since 1951	Mobile Dispensary calls at Tanjong Kling once a week	Nil. Healthy	Wells which dry up during hot season	Abdul Hamid bin Juma'at
Pulau Samulon ..	(approximately 330 —1952)	Children go to Tanjong Kling School	Weekly visit by Floating Dispensary and fortnightly visit by I.W.C.	do.	Nil. Long prophyloxis	do.	A. Ghani
Pulau Damar Laut ..	126	do.	Twice a month at Tanjong Kling by I.W.C.	Mobile Dispensary at Tanjong Kling once a a week for medicine	Nil. Healthy	Two standpipes available at Tanjong Kling	Ahmad bin Yunos (lives at Tanjong Kling)
Pulau Damar Darat ..							
Pulau Ayer Merbau ..	69	Nil.	Three weekly visits attend at either Tanjong Kling, Pulau Samulon or Pulau Seraya	Three weekly visits at Tanjong Kling, Samulon or Pulau Seraya	Nil. Healthy	Wells ..	Rapin bin Lembeng
Pulau Ayer Merlimau ..	86	Nil.					Rapin bin Lembeng
Pulau Ayer Chewan ..	39	Nil.					Rapin bin Lembeng
Pulau Pesik	20	Nil.					Rapin bin Lembeng
Pulau Sekera	18	Nil.					Rapin bin Lembeng
Pulau Sebaros (Seburos) and other islands uninhabited	4	Nil.	Go to Pulau Seraya	Nil.	Nil.	Take water from Pulau Seraya	Abdul Hamid bin Juma'at

WELFARE ON PRINCIPAL ISLANDS IN THE VICINITY OF SINGAPORE—*continued*

Name of Island	Population at 1952 Census	Schools	Infant Welfare and Maternity Clinic	Medical Dispensary	Anti-Malarial Work	Water Supply	Ketua
Mukim XXXIV: Penghulu: Awang bin Mahmud							
Pulau Bukom Besar (Shell Co.)	2,822	School housed in A.P.C. building.	The Shell Co. has its own.	The Company has its own.	Oiling by Company. Some permanent drainage	The Company has its own water supplied by waterboats.	Awang bin Mahmud
Pulau Bukom Kechil ..	(approximately 550 —1952)	Has a school now. Opened this year	Every week by Floating Dispensary since 1951	Medicine supplied by visiting nurse and hospital assistant	Permanent Works	4 Anti-Malarial wells	Awang bin Mahmud
Pulau Sudong	(300—1952)	School erected by Kesatuan Melayu. Teacher paid by Government	Every week by Floating Dispensary since 1951. Every 3 weeks by I.W.C.	Teacher has a stock of medicine supplied by G.H.O.	2 Anti-Malarial drains. D.D.T. spraying 1952-53	2 Anti-Malarial wells	Bendol bin Bengol
Pulau Semakau ..	(246—1952)	School erected since 1951. Government teacher.	do.	Medicine supplied by visiting nurse and hospital assistant	D.D.T. spraying 1952-53	1 Anti-Malarial well	Jalil bin Kerip
Pulau Seking	(173—1952)	Nil.	do.	do.	Permanent works	Anti-Malarial wells	None

WELFARE ON PRINCIPAL ISLANDS IN THE VICINITY OF SINGAPORE—*continued*

Name of Island	Population at 1952 Census	Schools	Infant Welfare and Maternity Clinic	Medical Dispensary	Anti-Malarial Work	Water Supply	Ketua
Mukim XXXIV: Penghulu: Awang bin Mahmud							
Pualu Pawai ..	(300—1952)	Nil.	Weekly service	Mobile Dispensary	Owing to sudden increase in population spraying about to be started.	Earth wells ..	Bendong bin Bengol
Pulau Sebarok* ..	3	Nil.	Nil.	Nil.	Nil.	Well water ..	Bendong bin Bengol
Pulau Senang ..	3	Nil.	Nil.	Nil.	Nil.	Carried ..	Bendong bin Bengol
Pulau Sekijang Pelepah (Lazarus Island)	Some 150	Nil.	People from Sekijang, Pelepah obtain their medicine and other health facilities from Sekijang Bendera, the Quarantine Station	From nearby Quarantine Station	Extensive Anti-Malarial drainage	Good well water (Anti-Malarial)	Khairan bin Haji Ahmad
Mukim XXXIII: Penghulu: Tungku Ahmad bin Tungku Sulong							
Pulau Tekong and Pulau Tekong Kechil	2,872	1. Government Malay School adjoining Police Station Kg. Selabin	*Infant Welfare* A Government midwife resides on island in *Maternity Clinic* in rented building	Visiting dispensary at present but drugs by visiting staff	Extensive permanent works plus oiling	Wells. The supply of water on this island is good and plentiful. Anti-Malarial wells have been built by Government and those meant for purposes other than drinking are enclosed by brick walls	None at the moment but the Penghulu intends applying for at least one to assist him to do his work in Pulau Ubin
Note:—The information refers to Pulau Tekong Besar. With the exception of private water supply from wells, there is nothing to be got at 'Tekong Kechil'. People living here go over by boat to Tekong Besar for everything. There is a 'receiving set' at 'Tekong Besar' which was supplied by P.R.O. and is now operated by the Penghulu		2. Proposed Malay School to be built privately on titled land at Kg. Pasir. The students living in this kampong have to walk about 3 miles to Kg. Selabin to attend school at present.	Nurse and Sister visit weekly				
		3. Three Chinese Schools were functioning at one time on this island—	Weekly visit by dispensary accompanied by a Doctor				

*S.V.O.C. installation. They make their own arrangements.

Public Relations

This shows auger in action for making a bored-hole latrine

Public Relations

Village Sanitation

Public Relations

Village Sanitation

The Hawker Problem in the Rural Area

Public Relations

The Vaccination Campaign

Public Relations

Post-natal Babies

Public Relations

At a Maternity and Child Welfare Centre

Public Relations

At a Maternity and Child Welfare Centre

WELFARE ON PRINCIPAL ISLANDS IN THE VICINITY OF SINGAPORE—*continued*

Name of Island	Population at 1952 Census	Schools	Infant Welfare and Maternity Clinic	Medical Dispensary	Anti-Malarial Work	Water Supply	Ketua
Mukim XXXIII—*continued*							
		the oldest one was teaching only Chinese. Two other schools have sprung up since the re-occupation—one is giving English lessons as the principal subject whilst the second school is catering for students who could not get admission to the first school. The third school has closed down temporarily	A proper centre is being built.	A dispensary is being built.			
Mukim XXXII: Penghulu: Tungku Ahmad bin Tungku Sulong							
Pulau Ubin	1,456	1. Proposed Malay School near Malay Kampong—building erected on private land but school is not functioning	Nurses and Sisters visit this Island bi-weekly at the clinic	Nil.	Oiling and drainage—House spraying	Private wells ..	The Penghulu intends applying for at least one to assist him to do his work in Pulau Ubin
		2. Chinese school at Kampong 'Chandu Kongsi'		Weekly visit by Floating Dispensary since 1951			

CHAPTER THIRTEEN

SCHOOL HEALTH

THE HOPE expressed in the 1951 Annual Report that with an increase in the professional staff it would be possible to cover a fairly large section of the school child population was fulfilled to some extent. With eight medical officers concentrated on this work a total of 89,973 children was covered in routine and special examinations during the year.

Such a service should cover at least once every year all children in schools, and also be able to re-examine those who have been referred for treatment so that progress can be observed and noted. In the current year there were 155,464 pupils in schools and the fact that only 41,181 could be fully examined as a routine measure points to the necessity for further expansion in this direction. Owing to increasing work in other sections of the Department it was necessary to detach certain officers temporarily to relieve the pressure elsewhere. So work in the main had to be limited to entrants and school-leavers.

The school medical service is under the charge of a Lady Medical Officer, who is assisted by three Lady Medical Officers and three Medical Officers. The School Tuberculosis Service—a post-war innovation—is managed by another Lady Medical Officer with special experience in this field. The nursing staff consists of one sister and two nurses. During the year a staff nurse was sent to the United Kingdom to undergo the Health Visitor's course. A Sanitary Inspector assists in the inspection of school premises and compounds.

The Education Department is expanding rapidly and unless more staff becomes available this service will continue to find itself unable to cope with the increasing work called for.

The need for the provision of a suitable building for clinics is becoming more and more obvious as the years advance. At the moment school medical clinics are held at North Canal Road, Paya Lebar and Teluk Kurau, and dental clinics at the Tan Tock Seng Hospital. The North Canal Road Clinic is far too small to cope with the large numbers of children seeking treatment. It is also subject to flooding. A well designed school medical and dental clinic centre which will also offer ample facilities for a tuberculosis clinic and B.C.G. immunization is envisaged under the Medical Plan.

There are at present 517 registered schools in Singapore. The figure also includes afternoon schools held in the same premises as morning schools and the Junior Trade School. These schools can be classified as follows:—

Govt. and Govt. Aided Schools	*No. of Schools*	*Enrolment*
English	120	63,487
Malay	60	9,678
Chinese	94	49,525
Indian	20	1,213
Junior Trade School	1	185
Sub Total ...	295	124,088
Private Schools		
English	38	7,224
Chinese	184	24,152
Grand Total ...	517	155,464

Note:—The term English School may be misleading to the non-Malayan. It is not meant for the reception of English or European children, but is a school in which the medium of education is the English language and is open to all races and creeds.

Almost all the Government and Government-aided English schools and Malay Vernacular schools were covered by examination during the year. The large number of Chinese-aided schools cannot be examined yearly with the staff available but an endeavour is made to have them covered every two or three years. As most of the Government schools except new entrants have been fully examined since 1947 only the first two primary classes and the two senior classes (those about to leave school) were included in the routine examination. Any child in the intermediate classes, however, who needed a full medical examination was seen. The principals of these schools were most co-operative. The large majority of the children examined were found to be in reasonably good health.

The new regional schools are also bringing in a section of the child population which has hitherto received little or no state medical assistance, and there is a tendency for these children to show a much poorer state of general health than those dealt with in the past. This fact has a bearing on the present and certainly on future comparative rates. That a majority of them come from the lower income groups will reflect on our figures for tuberculosis.

The improvements observed in the descending morbidity and general mortality rates were also reflected in the health of the children examined. Reasonably good health was seen in more than 92.8 per cent of boys and 90.3 of girls.

Vaccination

The school section entered vigorously into the anti-small-pox vaccination campaign initiated in August and carried out 101,937 vaccinations.

Skin Condition

The very great improvement observed in the previous year when skin disease was noticed to have dwindled from 22.38 per cent for girls and 11.74 per cent for boys in 1950 to 8.8 per cent and 10.36 per cent for girls and boys respectively was further maintained during the year. Skin affections were observed in 9.4 per cent of girls and 7.71 per cent of boys. Sores and impetigo and minor fungus infections accounted for most. Scabies was observed in 2.3 per cent of girls and 1.2 per cent of boys. This disease is particularly prevalent in Malay schools, but since the introduction of home visits and treatment of those affected in the home also, it has been possible to record a considerable reduction in its incidence. Lousiness was found in 11.59 per cent of girls, the incidence in boys being 0.04 per cent. The practice of keeping tresses long naturally favours the breeding of these vermin. This is further complicated by the belief in certain sections that the presence of these pests is a guarantee of the continuing favour of the Goddess of Fortune.

Worm Infestations

School children continued to be treated for worm infestation during the year. Normally the school section has a travelling dispensary which amongst other things treats school children in the outlaying areas for worm infestation —generally not based on the examination of stools. During this year, however, this van had to be deviated for the purpose of promoting the vaccination campaign and in consequence, it could not cover as many cases as it did in the previous year. Rural and even in many cases city residents are subject to helminthiases, particular with the ascaris. Not all areas are sanitated satisfactorily and not all people can be induced (and in some instances can afford) to wear shoes. So a child living in insanitary surroundings is constantly exposed to re-infestation and the elimination of worms by treatment becomes a temporary measure which needs frequent repetition.

There can be little doubt that helminthiases in the rural areas is extremely high, but until our primitive method of night-soil disposal in many districts is substituted for more modern sanitary systems we cannot hope to eliminate this trouble satisfactorily.

Eyesight Defects

4.18 per cent of boys and 6.18 per cent of girls were found to be suffering from defective vision. When the rough examination possible in the school or school clinic reveals a defect of vision the child is sent to a qualified optician, and in the event of the parents being unable to pay, the Education Department gives financial aid. Eye conditions requiring expert advice and treatment are referred to the Eye Department at the General Hospital. While such conditions are not very common the finding of only 53 cases of trachoma among boys and 2 cases among girls examined, is thought to be an understatement.

Anæmia

In 1951 4.15 per cent of girls and 10.85 per cent of boys were found to have under 60 per cent hæmoglobin in their blood. The 1952 figures are a complete reversal of the position for 2.69 per cent of boys and 6.77 per cent of girls are recorded as being in this state. The fact that school examinations are largely confined to new comers and school-leavers may explain these vagaries, but the 1952 figures are more in line with what is to be expected.

Bone and Joint Conditions

Four cases of tuberculosis of the hip joint, three of Potts' disease, four of cleft palate and 269 of postural defects were referred to the Specialist at the General Hospital for treatment.

Health in Island Schools

The schools on Pulau Seraya, Pulau Semakau, Pulau Brani, Pulau Bukum and Tanjong Kling were inspected during the year. The condition of the children was good and only minor complaints were observed. Treatment was given where necessary.

A few cases of mild vitamin 'C' deficiency and of conjunctivitis were observed at Pulau Semakau and Telok Saga. Eighteen children had just palpable spleens at the former but none of these showed malarial parasites in their blood.

Nine cases of anæmia were discovered at Pulau Seraya and three children had just palpable spleens.

At Pulau Bukum two schools are run by the Shell Company, one Malay and one European. A few cases of anæmia were seen at the former but only three just palpable spleens were found.

Most of the children have had B.C.G. vaccinations and arrangements were in hand to finalise the X-rays of teachers not dealt with so far.

INFECTIOUS DISEASE IN SCHOOLS

Attention has already been drawn to the increasing prevalence of such diseases as mumps, measles and chicken-pox. Since the liberation owing to the shortage of schools, it has been the practice to hold afternoon sessions in most, many of them also affording facilities for adult education classes in the evenings. In addition a number of new regional schools have appeared. The holding of two and more sessions with hardly any interval between sessions certainly favours the spread of these infections.

Where notification was received of infectious disease in pupils, the houses of all contacts were visited, quite apart from the normal school action called for. This has been necessitated by the fact that even after a child is excluded for a period from school for this reason, parents insist on sending the other children back to school.

Chicken-pox

526 cases of chicken-pox were investigated as against 662 in 1951, and 253 in 1950. The disease itself is of course not dangerous but it is very necessary to make certain that the case is not one of small-pox. If it were not for this danger chicken-pox would attract very little attention.

Measles

445 cases were investigated as against 462 in 1951 and 59 in 1950. Serious respiratory complications however are not as frequent in this condition in children of school age here as in many other countries.

Whooping Cough

Whooping cough which has been showing a declining incidence over the post-war years was not observed in the schools during the year. There were only four cases in 1951 against 29 in 1950. Because of this and the doubt as to the lasting effects of the immunity conferred, and the presence of poliomyelitis, general immunization against this condition has not been practised recently.

Mumps

436 cases of infectious parotitis were investigated during the year. This is a troublesome disease from the educational point of view because of the long quarantine period of three weeks. It is necessary to limit the spread as far as possible by keeping the patients away from school until they have recovered.

Diphtheria

Thirty-eight cases were notified from amongst the children of school age i.e. 38 out of 155,464. This figure compares with 56 out of 147,442 in 1951, and 28 cases out of 132,565 in 1950. While admittedly the figure is low there has been a definite general increase in the number of cases. Cases tend to be sporadic but in view of the fact that in many instances only the severer forms are reported or recognized it is probable that numbers of mild infections may not come to the notice of the medical authority.

Typhoid Fever

Only fourteen cases of typhoid were notified. These were from different schools and occurred at different times. At no period was there any suggestion of an epidemic state.

Leprosy

Neuroderma (N.D.) is the term used to designate those cases of neural leprosy which are non-infectious and need no isolation.

Neuroderma is classified as N.D. 1, N.D. 2, and N.D. 3, according to the stages of the disease. They are negative to smears and snippings and

respond very well to sulphetrone tablets. One tablet 3 times a day is combined with Ferri tablets multivite tablets and cod liver oil. Most of the cases show a considerable degree of tolerance and maintain a satisfactory hæmoglobin percentage over a considerable period.

Sulphetrone treatment in itself is insufficient. Sepsis, dental caries, helminthic infection, respiratory and cardiac disease all receive equal attention. It has been found desirable in practice to avoid diets containing prawns, crabs, shell-fish, lobsters, salt-fish, bamboo shoots and durians, as more reactions have been observed after such meals.

Forty-four cases of neuroderma were under treatment at the North Canal Road school clinic during the year. Two lepromatous cases were sent to the Trafalgar Home. Eleven were discharged as having no more evidence of disease.

At the end of the year twenty new and eleven old cases were under treatment.

TUBERCULOSIS IN SCHOOLS

The aim of the Schools' Tuberculosis division remains as before, the early detection of pulmonary tuberculosis and the prevention of the adult type of the disease in school children.

In dealing with tuberculosis in schools the method adopted has been to start from the known case coming from a school, either pupil or teacher, and to investigate all contacts by all possible means. Then to offer B.C.G. inoculation on a voluntary basis to all tuberculin negative children. The figures and rates of the incidence of tuberculosis arising from these investigations cannot be regarded as expressing a true measure of the prevalence of the disease in school children. Until the staffing position improves considerably, however, such random sampling is all that can be attempted.

The reports which set the machinery of school investigation in motion issue from the school health officers and nurses, from the Tan Tock Seng Hospital almoners and from health visitors. Mass X-raying of the school children and the teachers concerned or class X-raying, or skin testing with tuberculin is the rule. Positive results are then investigated further. The Singapore Anti-Tuberculosis Association (S.A.T.A.) has rendered very valuable assistance in this X-raying technique and in reporting results.

School teachers included in this scheme now come under the Government Tuberculosis Specialist at Tan Tock Seng as he is responsible in deciding their fitness to teach or otherwise.

SCHOOL TUBERCULOSIS CLINICS

North Canal Road School Clinic

Here clinics are held regularly on feeding and routine treatment and on primary tuberculosis and cases for observation.

Tan Tock Seng School Clinic

Two clinics are held here every week. These deal with all contact cases. By this means it is possible to isolate even parents when they are spreading the infection.

Paya Lebar Government Clinic

The School Tuberculosis Officer holds regular feeding and examination clinics here.

SCHOOL CHILDREN X-RAYED UP-TO-DATE (1948–1952)

Numbers examined radio-logically	Numbers with Pulmonary Tuberculosis present radiologically	PRIMARY COMPLEX		RE-INFECTION		Post Primary
		Active	Healed	Active	Healed	
19,498	1,128	763 (3.9)	529	166 (0.9)	47	1

SCHOOL TEACHERS X-RAYED

The survey on teachers started in 1949 was completed to the following extent:—

——	Number examined radio-logically	Ab-normal films	TOTAL ACTIVE CASES		Total arrested	Total still under obser-vation	Per-centage active
			Sputum positive	Sputum negative			
Males ..	1,261	67	3	17	101	3	1.6
Females ..	1,676	119	6	24		17	1.8
Total ..	2,937	186	9	41	101	20	1.7

The results of the 1951 and 1952 X-ray of children and of their further investigation and assessment were as follows:—

Nothing abnormal detected	7,820
A. Active adult type Tuberculosis with positive sputum ...	27
B. Active adult type Tuberculosis with negative sputum ...	80
C. Inactive or arrested Tuberculosis	31
D. Active primary complex	471
E. Healed primary complex	230
F. Tuberculosis of the spine and bones	10
Diaphragmatic hernia	19
Other findings (not tuberculosis)	469
Under observation (not assessed)	709
Pleurisy, pneumonitis and glands	43
Total ...	9,909

A., B. and F. total 117 cases and comprise those which show tuberculosis in the way ordinarily understood by laymen. The age distribution of those with positive sputum was as follows:—

Age in years	*Girls*	*Boys*	*Total*
8	0	1	1
13–14	2	1	3
16	1	6	7
17–19	3	9	12
20–21	1	2	3
	7	19	26

It will be seen that of the 26 sputum positive cases 23 were in teen-agers and that the age group most affected was between 16 to 19 years. These findings, even if of limited value, have a public health significance, since these children will be leaving school soon to earn a living or to go on to higher studies. Of the 9,909 children X-rayed over the last two years 117 or 1.2 per cent turned out to be active, a figure corresponding with previous child surveys, with 0.26 with positive sputum.

C. (31 cases) are those who have had tuberculosis but where the disease has healed. Whether this healing will go on to a permanent cure depends largely on the stresses and strains to which these young people may be subjected in their future life.

D. In any area where tuberculosis is a common disease children must sooner or later come in contact with its germs. This applies to most parts of the world. A few of these germs settle in the upper part of one or other lung and the surrounding tissues react to their presence. In the large majority of cases an immunity develops and the child is left with a relatively lasting resistance to further small infections. The reaction of the tissues is beneficial and is called a primary complex. It is closely related to the immunizing of persons against infectious disease by vaccination or inoculation.

E. This figure relates to those children who have had a primary complex as in *D.* and in whom the reaction has died away. It is, as it were, a vaccination scar which will gradually become less and less apparent.

TREATMENT

School children requiring active treatment for tuberculosis are under the care of the Tuberculosis Specialist at Tan Tock Seng Hospital. Many are admitted, but where circumstances and financial considerations permit the children are treated at home.

TUBERCULOSIS DOMICILIARY FEEDING SCHEME

The tuberculosis 'feeding scheme clinic' continued to be held at the North Canal Road and the Paya Lebar school clinics. The purpose of this scheme is to give extra food to those children with active primary complex who live in poor homes and whose parents cannot afford to give them the kind of food necessary to ensure that the child shall make a complete recovery and not go on to becoming an actual case of tuberculosis. A majority of those fed showed this tendency to tuberculosis: others, because they were either tuberculosis contacts or were in such a poor state of physical health as to favour the appearance of the disease in them were also included in the scheme. In the normal child the primary complex generally causes no apparent effect, but in the under-nourished and the over-taxed ill health may be observed during this period. Extra food and extra care are essential in such cases.

The extra food provided weekly consisted of:—

12 eggs.
¾ lb. vitaminised margarine.
1 lb. dried milk.
8 oranges.
5 large spoonful of ovaltine.
2 cigarette tinsful of peanuts or groundnuts.

A total of 263 children were on the tuberculosis feeding scheme.

There is a danger of such a scheme being abused by poor parents to augment income at the expense of the child's health. All homes where children receive food are visited regularly by the health visitors and it is pleasing to be able to state that no case of selling of the food provided has been discovered so far.

Another difficulty which is encountered in homes where there are other children is that the food tends to be shared, so that the intended recipients do not get the full benefit. In consequence where the primary complex is associated with a known case of tuberculosis all the children living together are taken on to the feeding list as a preventive measure. Such numbers are however, very few.

A further difficulty is the securing of adequate rest for the child with a primary complex, and this is particularly difficult in the case of girls. The Chinese girl is expected to assist her mother and to look after her younger brothers and sisters. Unless she is too ill to be up and about a full day's work is expected from her. Also an overcrowded shop house is not an ideal place for rest and fresh air. It is often preferable for children of this environment to continue to go to school as they can live a more restful life in this way than by remaining at home. The need for a true 'rest home' for sick children in some country place beside the sea cannot be too greatly stressed. Here is the ideal opportunity for voluntary assistance to be undertaken on a large scale.

It is difficult to assess the benefits of such feeding schemes as this. The children are weighed at regular intervals but there is insufficient data available as to the normal weightage curves of Asian children in normal health and with adequate food. Even in countries where a vast volume of data has been accumulated and studied it has been found almost impossible to work out a satisfactory graph that could be used as a working model because of the variability of observation. An increase in weight due to age may yet be below the normal increase to be expected over the same period. In others it may express a definite improvement. Physical examination and re-X-ray can show when the primary complex has healed. Extra food and rest constitute a very sound method of treatment with the bed shortages in institutions which must continue to exist. So the scheme will be continued. It allows for 100 children to be dealt with at any time and 263 children were on the feeding list during the year. Each child was given a full examination every third week and in all cases concurrent diseases such as worm, scabies, etc., were treated. Cod liver oil is given as an addition to the extra food in all cases.

The following table gives a resume of those on the feeding scheme:—

TUBERCULOSIS DOMICILIARY FEEDING SCHEME

Type of Case	Number definitely improved	Number still under observation	Total
Primary Complex	47	37	84
Tuberculosis of the Spine ...	1	1	2
Tuberculosis of the Hip ...	2	2	4
Minimal lesion	2	2	4
Adult type	7	7	14
P.T. contacts (Primary infection and follow-up)	61	51	112
P.T. contacts X-rays N.A.D. ...	1	...	1
Opacities follow-up	31	9	40
Cervical Adenitis	1	1	2
Total ...	153	110	263

THE SCHOOL CLINICS

There are three school clinics in operation in Singapore. These treat children referred to the clinic as a result of school inspection, and children sent by headmasters and headmistresses for medical attention. For reasons beyond the control of the Department these clinics have to do far more work than a school clinic should and are in fact out-patient departments for children of school age. However, most of the cases seen would receive little or no attention if it were not for the out-patient function performed.

The main clinic is at North Canal Road. It is a small cramped building liable to be flooded when heavy rain coincides with a high tide. This clinic is open on Monday, Wednesday, Friday and Saturday in the morning, and on all days except Saturday and Sunday in the afternoon. On Thursday morning the tuberculosis feeding scheme operates from here. Paya Lebar Outdoor Dispensary is used as a school clinic on Monday and Friday afternoons. The clinic at Teluk Kurau is held in a small room in the Teluk Kurau English School building. It is open on Tuesday afternoons. Serious cases seen at the two smaller clinics are referred to North Canal Road for complete examination and treatment.

Number of Cases seen at Clinics

	New Cases	*Re-visits*	*Total Attendance*
North Canal Road	10,157	15,518	25,675
Paya Lebar	1,394	1,682	3,076
Teluk Kurau	646	1,168	1,814
Total ...	12,197	18,368	30,565

The North Canal Road school clinic laboratory carried out 72 blood films examinations, 2,952 other blood tests, 2,292 stools examinations and 518 other examinations. In the stools examinations ankylostoma ova were evident in 264 specimens while round worm ova were found in 612 specimens, only 26.7 per cent out of the 2,292 specimens examined. Of the 72 blood films, none showed malaria parasites.

SANITARY REPORTS ON SCHOOL PREMISES

Twelve new school buildings were completed and occupied during the year. In addition four dwelling houses have been converted to serve as schools.

During the year sixteen plans for new schools and twenty-seven for additions and alterations to existing school buildings were approved. Twenty new premises were recommended for registration as schools while six were rejected.

Regular inspections of all existing schools were carried out in order to ensure, and where necessary to enforce, reasonable sanitary conditions. Defects and nuisances observed were reported with recommendations to the Education Department. During the year, the School Sanitary Inspector carried out 600 inspections. In addition District Sanitary Inspectors made 2,125 such inspections, thus making a total of 2,725 inspections for the year.

SCHOOL TUCKSHOPS

A feature of the schools of Singapore is the number of hawkers who congregate round the gates of each during the intervals and when the children are leaving to return home. These hawkers sell various sweetmeats and drinks which, although they appeal to the taste of the children, have little to recommend them to the Health Officer in either their method of preparation, or in

the manner in which they are exposed for sale. The situation is aggravated by the fact that many of the children leave home in the early morning without having eaten an adequate meal. By the interval they are really hungry and the hawker finds a ready sale for his goods. So persistent are these hawkers that in some places they even place themselves on the verandahs outside the class-rooms and only the threat of force, with the power to implement it, can evict them from the school premises. These individuals are therefore a menace to the child health of Singapore.

For a child to come to school in the morning without an adequate meal is most undesirable, the lowered vitality due to hunger favouring the spread of disease and seriously affecting the capacity of the child to benefit from the instruction received. So the provision of properly conducted school tuck-shops where wholesome articles of food and drink can be provided during intervals is very important. These exist in some of the better run schools, but even so the competition from the hawker without the gate must be ruinous. Proper drinking fountains should be provided wherever the presence of a pipe water supply permits.

During the year, 325 hawkers operating in the schools were X-rayed and of these ten were found to be suffering from tuberculosis. Forty others were referred for further medical examination.

Proper tiffin sheds are not available for many of the schools, including all regional schools. The result is that hawkers and students congregate in passage-ways, the compounds and even in the latrine block.

SUPPLEMENTARY FEEDING FOR SCHOOL CHILDREN

As in previous years the greater part of any supplementary feeding for children has been conducted by the Social Welfare Department at 'Feeding Centres' now called Children's Social Centres. While these centres do not cater for the school child as such, they supply the need of those children who ordinarily do not go to school, and in addition to the provision of meals, simple education classes are also conducted in them.

Senior School Medical Officer: Dr. S. Kiani, L.M.S. (Singapore), D.C.H. (London).

CHAPTER FOURTEEN

DENTAL HEALTH

THE DENTAL services in Singapore continued along the lines described in the last report. A little over three years ago the Colony had no public dental service, except for such treatment of the general public as could be provided—quite secondarily to the instruction of students—at the Dental School of the College of Medicine. With the establishment of the University and the separation of the Medical and Dental Schools from the Government Medical Department there arose a demand for a Government dental service. Early developments have been concentrated on a service for school children as a first priority. A Chief Dental Officer was appointed in 1951 to plan a steady expansion on these foundations.

It was not possible to increase the number of Dental Officers at the School Dental Clinic, Tan Tock Seng Hospital; this varied during the year, averaging rather less than three. 1952 was the third full year of operation, and emphasis was laid on consolidation. Extensive examinations carried out in the first two years had revealed an enormous extent and high concentration of dental caries, and 1952 was largely devoted to the treatment of this. The number of examinations of new patients and the time given to these examinations were reduced accordingly. The arrival of the first Dental Nurses, however, began to change the nature of the Dental Officers' duties so that some of their time was spent on supervision and a good deal of it on treatment of a more specialized nature than before. Nevertheless, they dealt with 10,590 attendances of children from 18 schools and other institutions, inserted 10,327 fillings, extracted 5,799 temporary and 2,386 permanent teeth and completed treatment for 2,536 cases in all. 2,628 new cases were examined, and of these 2,374 required attention (90.3 per cent).

The first Dental Nurse returned from training in the Federation in January and was followed by two others in July. These nurses were employed at first in the School Dental Clinic, but by the end of the year three huts had been constructed for them in the grounds of schools, and a room had been adapted in another school. As a result they are able to examine and treat school children with the minimum of interference with classes. This system has been welcomed by the education authorities and is working well. It happened that they went into schools at the end of a term, but they obtained very satisfactory attendances of children during the holiday. In all, they had 2,123 attendances during 1952, inserted 2,753 fillings, extracted 1,017 temporary and 212 permanent teeth. Treatment was completed for 187 children.

The Government staff at the Dental Clinic, General Hospital, was reduced by the resignation of 3 Dental Officers, two of whom joined the University. The effect of this was partly offset by the appointment of 3 housemen in July, and the volume of work increased considerably over that of 1951: 10,054 new cases were admitted, and the total number of attendances was 37,988. The number of completed cases was small, a clear indication that the clinic served mainly as an emergency centre for the relief of pain. The total number of fillings was 5,813 (amalgams 2,712, silicates 593, others—principally inlays and crowns—2,508). Extractions numbered 27,935, and dentures inserted 1,223.

Small charges were made to cover the cost of materials where the patient could pay, and the total revenue received was $31,127.

The proposal for a dental clinic for the general public and some Government servants separate from the Dental School had to be postponed owing to lack of accommodation. Until this can be brought into being the Dental Clinic at the General Hospital will continue as a relief centre for pain, and indeed this function will increase, to the detriment of the high class conservative dentistry which should be the main purpose of a teaching school.

The Dental Officer, Police, examined 428 patients, and had attendances of 3,024. He inserted 2,151 fillings, and carried out 414 extractions. Treatment was completed for 424 patients. It was again remarked that the oral condition of the Gurkha contingent was good, but that of the Malays was poor. Plans have been submitted for improving the present police dental clinic or for building a new one at the Training School.

Dental treatment at Woodbridge Hospital and emergency treatment at Changi Gaol continued throughout the year, through weekly visits first by the Chief Dental Officer and later the Dental Officer, Police.

The Inspecting Officer, Dental Board, has been assisting at the School Dental Clinic for five sessions a week throughout the year, and has still been able to carry out routine inspection of the premises of unqualified dentists. There are now 259 of these on the register, and 457 visits were paid to their premises during this year. Warning notices regarding suspected 'covering', and instructions on cleaning and renovating premises were issued in 15 cases.

The Dental Officer, Royal Malayan Navy, commenced duties during the year. The Chief Dental Officer was asked to give advice on the layout and equipment of the surgery, and supplied some materials and equipment on loan.

During the year a request was received for treatment at Christmas Island. Portable dental equipment has been ordered, and it may be possible to send a Dental Officer on occasional visits to the island.

Investigations of the fluorine content of local water were made by the Department of Chemistry and by the City Analyst, and proposals are being formulated for the fluoridation of Singapore's water supply in order to reduce dental caries among children.

Chief Dental Officer: Mr. N. H. Gittins, F.D.S., R.C.S.

CHAPTER FIFTEEN

THE SINGAPORE ADVISORY COUNCIL ON NUTRITION

THE CONSTITUTION of the Council was approved by Government during the year. It now consists of *ex officio* members representing the Government Departments of Education, Social Welfare and Health, the City Health Officer, representatives of the University departments of Biochemistry, Social Medicine and Public Health, and Economics, and of five unofficial members who are elected for a period of two years. Guest members and visitors may be invited to attend the meetings of the Council. The Council accepted with regret the resignation of Dr. R. C. Burgess who had been a permanent guest and the liaison officer with the Federation of Malaya.

The problem of enrichment of basic foodstuffs as a means of increasing the intake of certain essentials in the diet continued to receive a lot of attention. The Council recommended to Government that steps should be taken to make enriched rice available to the community in the event of an emergency. It was considered desirable that provision should be made to put into effect immediately a policy of enrichment of rice and other staples should a deterioration in health in the Colony be observed under such conditions. In order to protect the consumer, legislation was recommended to control claims of manufacturers and retailers regarding the enrichment and fortification of foodstuffs with mineral and/or vitamins. The Council was represented on a special committee appointed to consider legislation appertaining to the Sale of Food and Drugs.

The modified meal provided in the Child Feeding scheme was discussed. The Department of Social Welfare reported that the 3 oz. bun was beyond the capacity of the smaller children, and to avoid wastage a 2 oz. bun was provided as formerly. The meal supplied in 1952 consisted of a 2 oz. bun made from flour enriched with thiamin, riboflavin and iron, and a drink made from skimmed milk plus Vitamin A (2,000 I.U. per child), with sugar or syrup (coffee or an alternative flavouring agent), and a piece of fresh fruit. It was recommended that the money saved by the substitution of cocoa by other flavouring materials should be used to enlarge the scope of the scheme. The Department of Education and the Government Chief Health Officer were to recommend to the Department of Social Welfare children who were in need of supplementary feeding.

The re-establishment of public restaurants was discussed as a means of assistance to the low income section of the community and as a method of checking an increase in food prices. It was decided that it was not economic to re-introduce public restaurants at present but that their usefulness in times of emergency should be borne in mind.

In order to meet the advance in the nutritional field which seemed to be desirable, the Council considered the training of workers in nutrition. Information is to be collected regarding the field of work and the level of training which will be necessary in various types of public health activity.

THE NUTRITION UNIT

During the year the Division of Applied Nutrition of the Department of Social Medicine and Public Health of the University of Malaya completed the growth study of the first year of 250 Chinese and Southern Indian babies living in the urban area of Singapore. The study groups were limited to the

lower income sections of the community, and to 'normal, full term' infants. The data were collected during a series of regular home visits to the families (4,300 observations). The material is now being prepared for publication. The progress of the infants will be related to the feeding regime, to the medical history, to housing and to certain social customs. The gain in weight is greater in the Chinese than in the Southern Indian infants and for the first 6 months of life is comparable with that in the European child. During the second 6 months the increase in weight of the Asian baby appears to be much less. Records of Chinese infants have been collected from rural Government Welfare Clinics for comparison with those obtained by the division in the urban area. This study will provide the basic material for assessing the effect of an altered dietary on the growth of infants.

Measurements of the height and weight of about 300 Chinese and 350 Indian pre-school children were obtained at 3 monthly intervals. The study is limited to the area in which the growth study was conducted and it will be continued until the records are sufficient for the construction of 'growth' curves.

The division continued to investigate factors which may influence birth weights, and a review on this subject has been prepared for publication. The records of 18,449 Chinese infants born in 1950 and 1951 were obtained from the Kandang Kerbau Maternity Hospital, Singapore. Only single births were considered, and all the infants were classified by the medical staff as 'full term and normal'. All were born to mothers in the lower income groups. The influence of the parity and the age of the mother on the birth weight of the offspring was assessed. The size of the infant increases with parity and the increase is statistically significant. The age of the mother is of lesser importance and doubtful significance. The analysis revealed that the effect of these two factors explains only a small proportion of the weight variation found in infants. The work will be reported as a joint publication with Dr. You Poh Seng (Statistical Unit, University of Malaya).

Three papers were published during the year:—

'A study of the effect of nutrition on fertility and the outcome of pregnancy in Singapore in 1947 and 1950'.

J. Millis, *Medical Journal of Malaya,* 1952. 6. 159.

'Thiamin loss due to washing and cooking enriched rice'.

P. C. Leong and J. H. Strahan, *Medical Journal of Malaya,* 1952. 7. 39.

'A palatability trial on a substitute for rice'.

J. Millis. *Medical Journal of Malaya,* 1952. 6. 180.

Thus during the year there was a considerable expansion of the research programme. This made such heavy demands on the staff that it became increasingly difficult to undertake further work outside planned projects. Nevertheless the Division gave advice to Government departments and undertook investigations of special problems such as the adequacy of the diets supplied to patients and nurses in urban hospitals. The Unit was represented on committees organized for the purpose of studying the Child Feeding Scheme, the diets for pre-school children, the levels of rationing of foodstuffs and the legislation appertaining to the sale of Food and Drugs. Three family investigations were undertaken at the request of the Almoner of the General Hospital. The division co-operated with the staff of the Eye Clinic in the investigation of the families of fifty-four cases of keratomalacia in infants and children who were admitted to the General Hospital. This work is part of a larger study of the circumstances surrounding the child which have resulted in

severe Vitamin A deficiency, and is a continuation of a project commented on in 1951. The aim is to assess the relative importance of ignorance, poverty and lack of hygiene which have resulted in a diet causing Vitamin A deficiency. Instruction is given to the mother on the best and cheapest way of improving the diet and level of hygiene in the home and if necessary financial help is recommended.

The teaching programme was expanded to include a series of lectures in nutrition in the course leading to the B.D.S., and the teaching responsibilities of the department will be further increased in 1953 in the course of social studies and for the Diploma of Public Health.

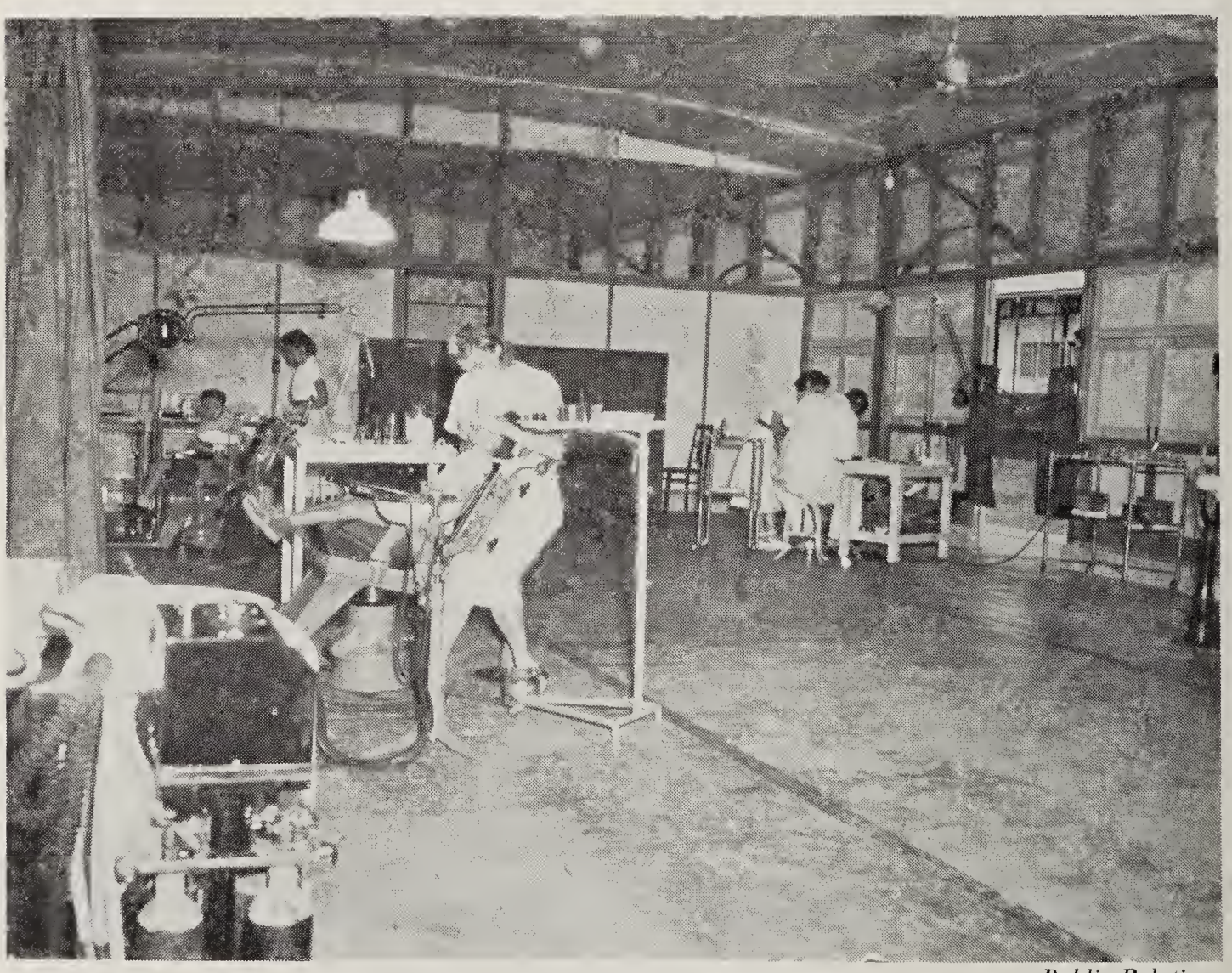
A Rural Coastal Village

Public Relations

A Travelling Dispensary in the Rural Areas

Public Relations

The Port Health Officer on his way to the Quarantine Anchorage



Public Relations

School Dental Clinic

PART III

THE HOSPITALS DIVISION

An Ambulance of the General Hospital Fleet

CHAPTER SIXTEEN

THE HOSPITALS DIVISION

GENERAL REVIEW

THE FOLLOWING table shows the steady increase in the number of in-patients and out-patients treated in all Government Hospitals (with the exception of the Quarantine Hospital and the Leprosy Settlement) over the past decade:—

MAIN HOSPITAL PATIENTS

	In-patients	Out-patients Attendances*
1938	25,913	87,447
1947	27,514	305,138
1949	32,998	461,238
1951	40,833	612,095
1952	55,057	726,310

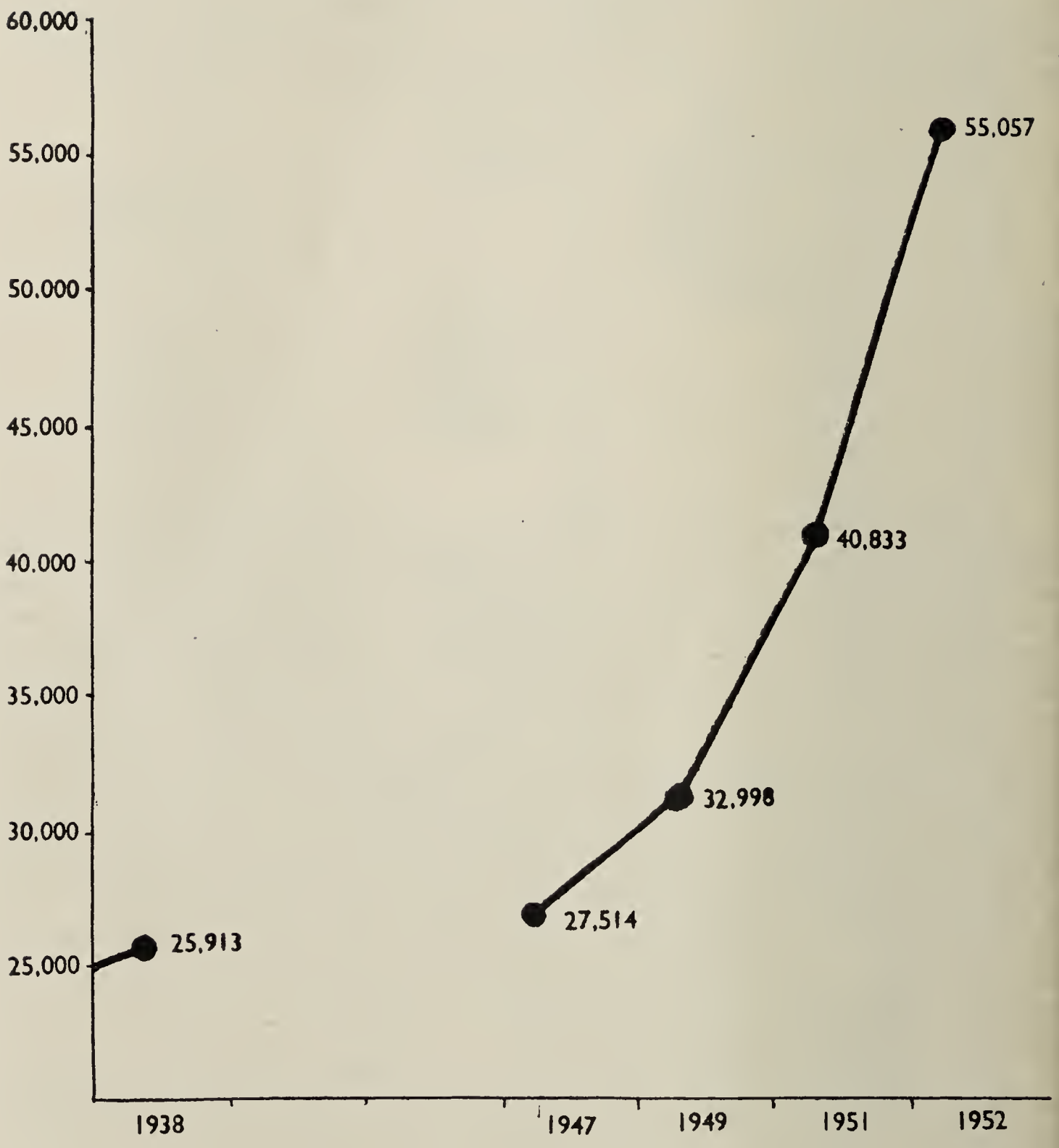
Analysis of these figures shows that the in-patients in Government hospitals have increased by 112 per cent since 1938 and by 35 per cent over the last twelve months. The increases in the out-patient figures are even more arresting. Compared with 1938 the out-patient attendances have shown an increase of 831 per cent. The numbers have almost doubled over the last three years alone. The accompanying two graphs based on the same figures may assist in demonstrating this almost unbelievable increase. When it is remembered that there has been no comparable increase in accommodation and in medical personnel it will be appreciated how great has been the burden of responsibility which the present policy has laid on the staff. Our aim has been that all patients in need of medical attention will be treated and it is to the credit of the medical department that this policy has been religiously followed with at the same time a very high standard of medical care. Even before the war it was realised that our facilities were outmoded and in need of reorganization. That such an organization has been capable of treating more than twice the number of in-patients and over eight times the number of out-patients is almost beyond belief to the initiated.

The first full scale effort to implement the Medical Plan was only made during the year under review with the construction of the New Nurses Hostel and the New Out-Patient Department together with a block of flats for Medical Officers. It is hoped that work on these projects will be completed early in 1953.

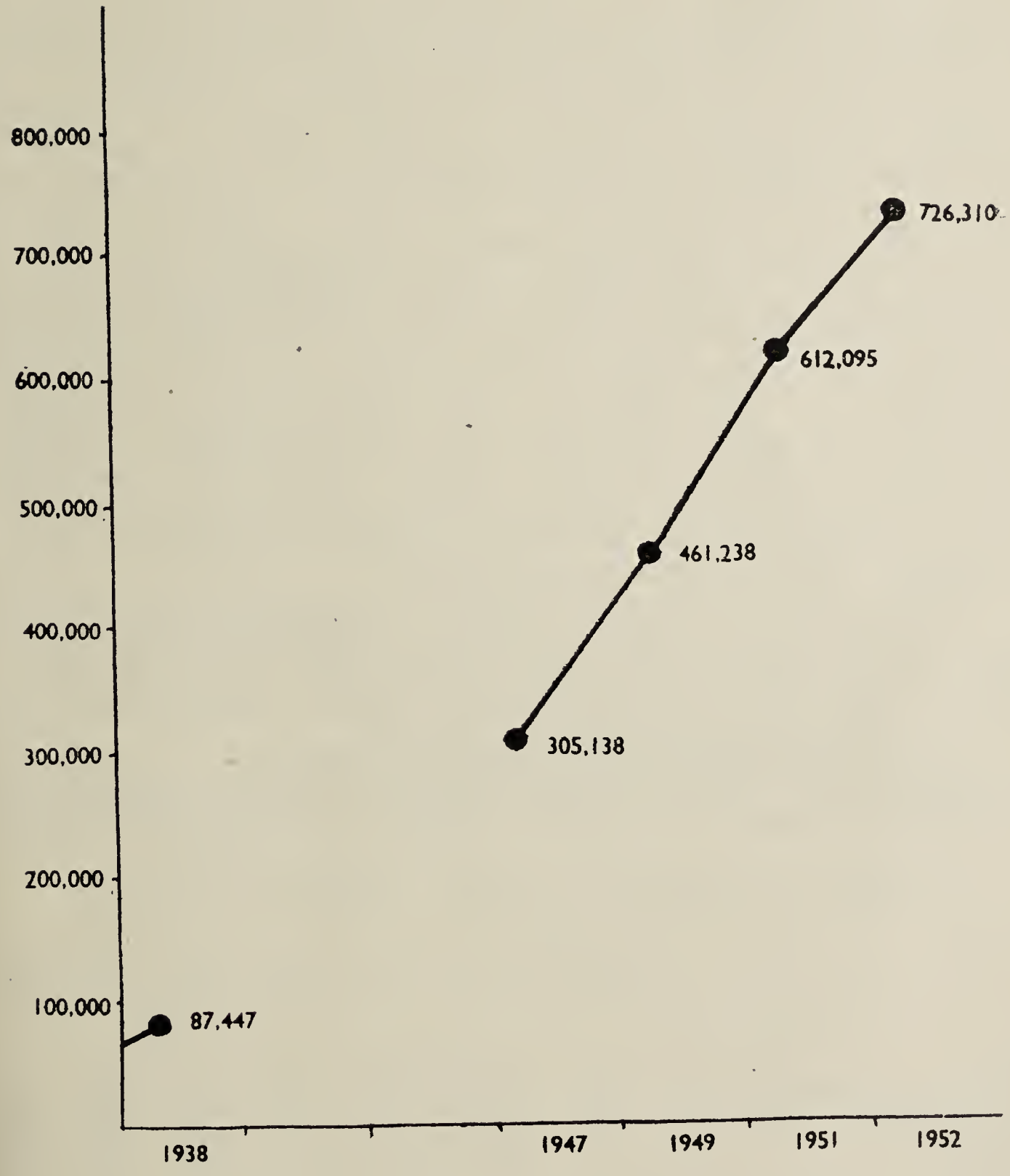
When it is remembered that the war ended seven years ago and that it is only now that work on the reorganization of the Medical Service has really started: when the magnitude of the burden laid on the medical staff is, even partially, realised: then it is hoped that any criticism levelled at the medical and nursing service will be tempered with understanding tolerance and that some tribute will be paid to this section of the Government Service for a difficult task well done under conditions of perpetual frustration.

* In previous reports special divisions were not included.

TOTAL NUMBER OF IN-PATIENTS TREATED
SINGAPORE MAIN HOSPITALS



TOTAL NUMBER OF OUT-PATIENTS TREATED SINGAPORE MAIN HOSPITALS



The daily sight of so much activity in the grounds of the General Hospital on the part of the Public Works Department has had a wonderful tonic effect on the staff. The knowledge that 'something is being done' at long last and that plans are being finalised for a further large programme of reconstruction next year speak louder than words.

It is hoped that from now on each succeeding year will witness further substantial progress towards the goal of an up to date Medical Service for the Colony which is the desire of all. If this proves to be the case then the year under review will stand out as an important land mark in the history of the Department, the point at which our plans and hopes began to be realised.

The necessity of recruiting and training nurses in preparation for the planned expansion being early realised, every effort was made during the year to recruit and train as many nurses as possible. However, in spite of the widest possible publicity given to the campaign, only 61 probationers were recruited during the year and there were some 50 resignations from the service. While a further 65 recruits appeared at the end of the year, the conclusion of the Chief Nursing Officer to the Colonial Office, who visited the Colony during the year, that suitable candidates will not come forward until first class accommodation and first class training facilities are forthcoming, adds point to our present situation. The new Nurses Home will not be ready until next year and there will be no proper nursing school accommodation until 1954 at the earliest. The more nurses there are the less over-worked those serving at present will be, and so the more attractive the career to those already serving and those to come. A reference to the remarks in the introduction is suggested in this connection. Another 100 nurses are required immediately: a further 300 as the Plan advances.

The provision of an up-to-date medical service depends on many factors not the least of which is a full complement of well trained nurses. The inability to recruit sufficient nurses may be the limiting factor in the planned expansion. The solution of this problem rests with the people of the Colony for whose welfare the medical service is provided.

The following table gives some idea of the distribution of hospital beds in Singapore in the various Government hospitals. It must be emphasised that in practically all cases the figures are continually and often greatly exceeded.

AVAILABLE BED STRENGTH OF VARIOUS GOVERNMENT HOSPITALS

———	Pre-war	1946	1947	1948	1949	1950	1951	1952
General	750	550	550	600	700	700	750	800*
Kandang Kerbau (excluding cots)	180	200	220	240	240	240	240	240†
Tan Tock Seng	600	400	400	550	572	600	540	565‡
Orthopædic	..	60	60	60	65	70	70	78
Prisons	140	50	50	118	118	140	140	160
Social Hygiene (excluding cots)	Part of General	60	60	60	68	70	70	70
Infectious disease	250	250	250	250	250	250	250	250
Leprosy Settlement ..	200	260	347	382	451	536	640	725¶
Police Training School ..	20	20	20	20	20	20	20	20
Mental	2,000	440	700	1,000	1,200	1,600	1,800	1,800

* Overcrowding under present conditions.

† Chronically exceeded as a reference to Chapter 20 makes clear.

‡ A reduction from 1951 through use of wards for staff quarters.

¶ Chronically overcrowded.

NOTE ON NON-GOVERNMENT HOSPITALS

The following institutions provide beds for the public: —

Kwong Wai Siu Free Hospital (Chinese) ...	400	(58 additional beds provided during the year)
St. Andrew's Mission Hospital (Children) ...	30	
Malayan Union Mission of Seventh-day Adventists	24	
Hainanese Hospital	20	
Kheh Hospital	30	

MAINTENANCE CHARGES OF THE MAIN HOSPITALS (DAILY AVERAGE)

——	Paying Patients (*a*)	Paying Patients (*b*)	Free Patients
General Hospital	$ *c.*	$ *c.*	$ *c.*
Maintenance including diet ...	18.82	17.09	15.05
(Diet only)	4.92	3.19	1.15
Kandang Kerbau Hospital			
Maintenance including diet ...	14.48	13.32	11.67
Tan Tock Seng Hospital			
Maintenance including diet ...	...	...	T.B. patients 10.65
Social Hygiene Hospital			
Maintenance including diet ...	...	...	10.33

IN-PATIENTS ADMISSIONS FOR THE YEAR 1952

Hospitals	Paying	Free	Total
General Hospital	2,953	19,800	22,753
Kandang Kerbau Hospital ...	2,406	18,020	20,426
Tan Tock Seng Hospital ...	...	1,465	1,465
Social Hygiene Hospital ...	...	2,434	2,434
Middleton Hospital	...	1,796	1,796
Orthopædic Hospital	...	79	79
Total ...	5,359	43,594	48,953

Excluding mental and leprosy cases, out of the total number of 48,953 in-patients admitted throughout the year 43,594 or 89.05 per cent were free cases. All leprosy cases were treated free. Some 1,634 or 94 per cent of mental cases at any one time are free cases.

As in the past the Ambulance Advisory Committee meets as and when required to review the Colony's requirements.

The number of ambulances in use at the various hospitals is as follows:—

General Hospital	... ...	4 in use and two due to arrive.
Kandang Kerbau	... ...	2 in use and one due to arrive.
Tan Tock Seng Hospital	...	2 in use.
Middleton Hospital	... ...	2 in use.
Fire Brigade Accident Service	...	4 in use.
Rural Board	... ...	1 in use and one budgetted for in the estimates.

The Chief Medical Officer, Singapore, Dr. R. Calderwood, M.B., CH.B., D.T.M. and H., D.P.H. was on long leave between April and August, when Dr. B. M. McOwan acted for him.

CHAPTER SEVENTEEN

THE GENERAL HOSPITAL

THE GENERAL HOSPITAL is the only hospital in the Colony for the treatment of acute medical and acute surgical cases, excluding gynæcology. As the hospital is continually overcrowded the basic bed strength figure of 700 is of mere academic interest. The daily average number of in-patients treated during the year was 738 and at times the figure of 760 was reached. This figure compares with 607 in 1949 and 670 in 1951.

The following tables give a summary of the work carried out and shows the ever increasing problem which is facing the Department.

GENERAL HOSPITAL—TOTAL PATIENTS FROM ALL SECTIONS*

——	In-patients	Out-patient Attendances*
1947	15,021	160,388
1949	16,051	234,173
1951	20,294	295,697
1952	23,421	358,769

The two accompanying graphs demonstrate this advance.

During the year the problem of treating the chronic sick still remained a handicap to the efficient working of the General Hospital. The cost of maintaining a single bed in an acute surgical and medical hospital is considerable and to justify such expense the beds must be used to full advantage. At the present time a proportion of these beds is continually occupied by the chronic sick and infirm who could be adequately cared for in an infirmary where the cost per unit would be considerably below that of the General Hospital. Also the present inadequacy of the surgical theatre accommodation has resulted to a certain extent in a bottle neck. By 1953 the building of two new modern theatre blocks will eliminate this and it is then that the problem of a proportion of the acute beds being continually occupied by chronic cases will be fully realised.

As has been mentioned, 1952 saw the start of our building programme which over the next two years will result in the modernisation of the hospital and the raising of the bed strength to over 1,000.

At the present time there are three Surgical and two Medical Units together with one Ear, Nose and Throat, one Ophthalmic and one Pædiatric Unit.

The hospital is also the main teaching institution for medical and dental students and is the training school for nurses.

The following self-explanatory tables give a brief analysis of the number and type of cases treated.

1952 saw the available resources of the hospital taxed to the utmost in dealing with out-patients and in-patients and both showed an increase over any previous year. The following tables are of interest in this respect.

* In previous reports special sections were not included.

CASES ATTENDING GENERAL OUT-PATIENTS DIVISION ONLY

Out-patients	New Cases	Repetitions	Total Attendances
1947	40,496	73,671	114,167
1949	45,966	107,568	153,534
1950	53,811	108,713	162,524
1951	59,576	125,555	185,131
1952	79,672	160,348	240,020

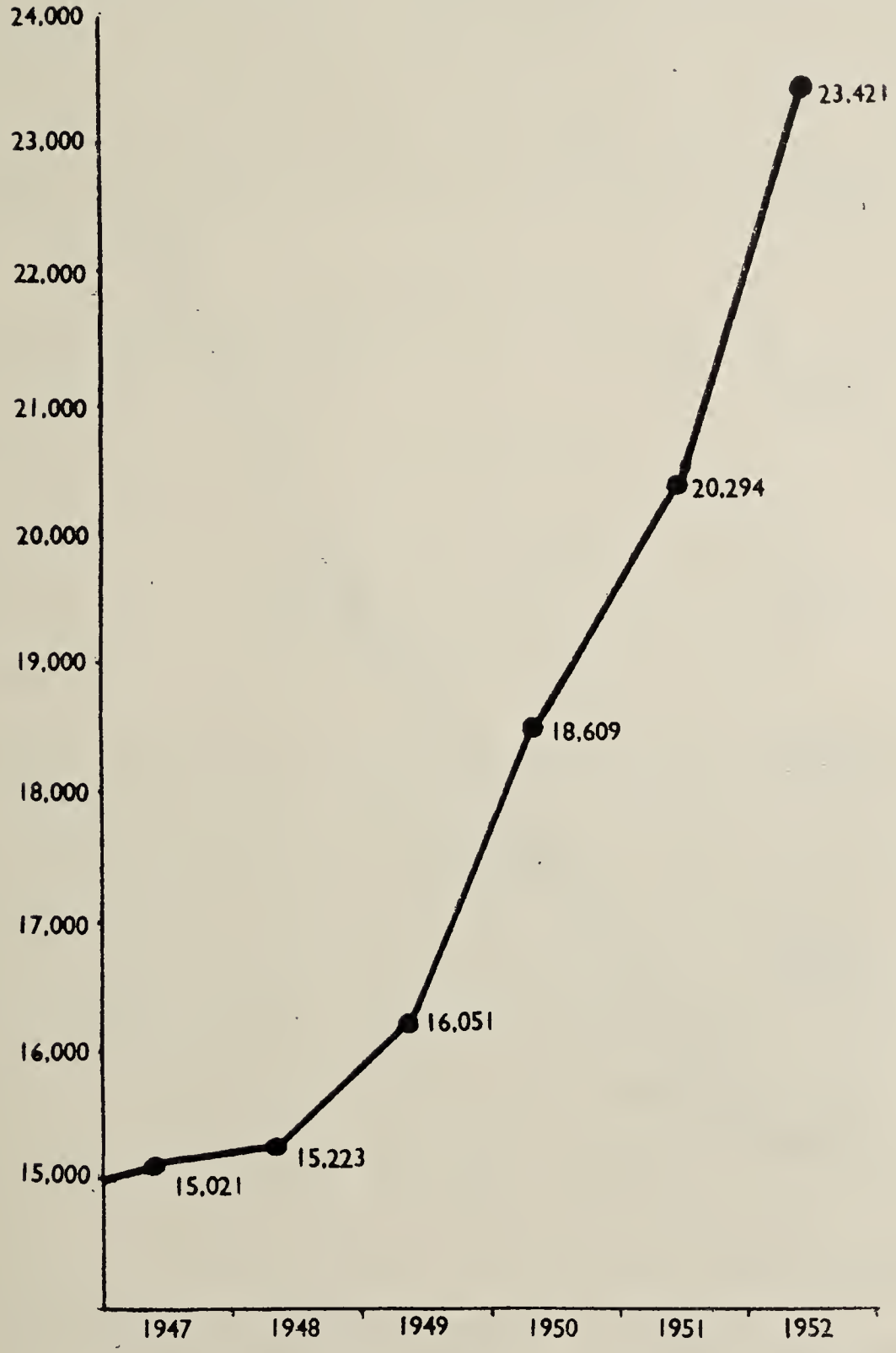
Races	NEW CASES				REPETITIONS			
	Male	Female	Child	Total	Male	Female	Child	Total
Europeans ..	1,248	664	472	2,384	2,571	1,296	1,120	4,987
Eurasians ..	618	596	391	1,605	2,014	1,386	934	4,334
Chinese	24,196	12,134	11,734	48,064	44,141	24,060	20,255	88,456
Indians	9,363	3,131	3,631	16,125	22,971	7,812	5,397	36,180
Malays	6,954	952	838	8,744	12,582	3,422	2,794	18,798
Javanese ..	1,513	208	211	1,932	4,232	534	472	5,238
Japanese ..	7	..	..	7	3	..	..	3
Others	534	150	127	811	1,282	588	482	2,352
Total ..	44,433	17,835	17,404	79,672	89,796	39,098	31,454	160,348

In addition, the Medical Officer-in-Charge of Officials dealt with special cases as follows:—

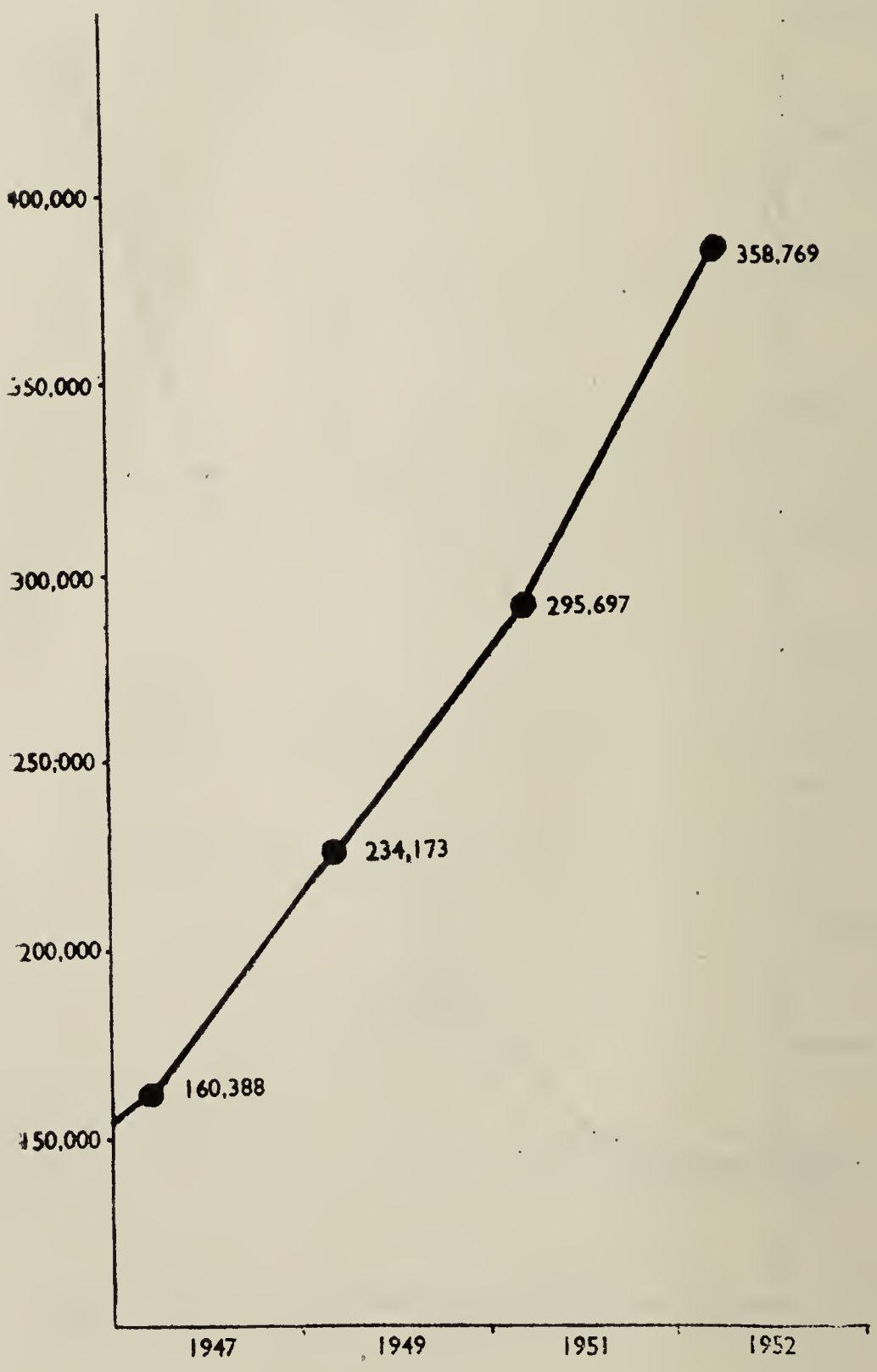
——	1949	1950	1951	1952
Examination of candidates for Government service ...	2,544	3,361	6,514	4,917
Inoculations and vaccinations ...	855	970	1,165	1,460
Medical Boards	108	85	119	88
Total ...	3,507	4,416	7,798	6,465

In-patients	Daily Average	Male	Female	Total	Deaths per cent
1949	607	11,357	4,700	16,051	12.5
1950	642	13,080	5,529	18,609	12.75
1951	670	14,329	5,965	20,294	11.56
1952	738	16,156	7,265	23,421	11.10

GENERAL HOSPITAL
TOTAL NUMBER OF IN-PATIENTS TREATED



GENERAL HOSPITAL
TOTAL NUMBER OF OUT-PATIENTS TREATED



The marked increase in the daily average number of patients reveals the serious overcrowding of wards that was a feature of the year and a constant strain on the staff when it is remembered that the duration of stay in hospital was again reduced to a minimum. Nevertheless this overcrowding could not be avoided over the year. The limit to the actual number of beds in use lies ultimately with the number of nurses available. Fewer nurses are required for overcrowded wards than for new wards. All available space was in use however except for one-half ward used for staff recreation. One complete ward and one-half ward had to be used for accommodation of nurses and housemen. With the increase in the nursing strength expected next year it is hoped to increase the number of beds in use to some 800. This will take the hospital to well over the pre-war strength. If the 360 used for Venereal Disease and Tuberculosis are excluded and some 300 added which were available for general medical and surgical cases at the Tan Tock Seng Hospital it will be seen that more general medical and surgical beds are even now available than ever before.

THE MEDICAL UNITS

There are three separate Medical Units one of which is exclusively used for the treatment of sick children.

Unit	Unit Chief	Basic Beds
Medical Unit I	Prof. G. A. Ransome, F.R.C.P., M.R.C.S.	112
Medical Unit II	Prof. E. S. Monteiro, M.D., F.R.F.P., & S., M.R.C.P., D.C.H.	100
Pædiatric Unit	Dr. G. Haridas, J.P., M.D., M.R.C.P.	84

The picture of overcrowding in the medical wards is typical of the hospital as a whole. With patients occupying beds on the verandahs and in the aisles it can be imagined how difficult it is to co-ordinate the teaching of an increasing number of medical and dental students and at the same time to allow the nursing staff to carry on with the nursing adequately.

The effort to admit all cases requiring attention has continued, however, and teaching facilities have been extended to both medical and dental students. While more and more beds are required for medical cases, there is no doubt that the new and modern out-patients division soon to be built will help considerably in this connection. The Department of Social Medicine continued to investigate the socio-economic background of selected cases. On the therapeutic side all the newer drugs were made available and were used on an ever-increasing scale, and with increasingly satisfactory results. This necessitated a very considerable increase in the drug votes for 1951 as compared with any previous year. There were no special features regarding the general run of the adult diseases dealt with.

The Almoner Service continued to serve the needs of the patients most conscientiously but is sadly handicapped by the lack of alternative accommodation to which it should be possible to transfer our chronic sick. Tan Tock Seng Hospital was only able to absorb very few as its own accommodation is strictly limited.

A generous gift to Professor Ransome of $50,000 has enabled him to form a Trust Fund for the purchase of research equipment over and above that purchased by the hospital. During the year a modern diagnostic neurological X-ray set was purchased on most advantageous terms from this Fund. The Government has now reimbursed the Fund for payment in the first instance of the apparatus in question which amounted to $9,710.

In the Pædiatric Unit, Dr. Haridas reports a mortality rate of 31.87 per cent amongst 3,590 children admitted. This is a reduction on the 1951 figure of 36.10 per cent when 2,720 children were treated. If deaths within 24 hours of admission are excluded, however, this figure drops to 19.39 per cent.

Diseases	Admissions	Total Deaths	Deaths within 24 hours	Discharges
Gastro-enteritis	1,312	460	312	852
Broncho-pneumonia ...	536	292	232	244
Bronchitis	198	2	2	196
Naso-pharyngitis	269	3	2	266
Empyema	8	3	...	5
Malnutrition	53	8	3	45
Congenital Syphilis	12	6	3	6
Tuberculosis:—				
1. Meningeal	107	90	16	17
2. Miliary	36	25	4	11
3. Pulmonary	47	10	2	37
4. Glands	9	1	...	8
	199	126	22	73
Intestinal Worms	78	9	5	69
Encephalitis	42	17	9	25
Meningitis	54	20	8	34
Nephritis	92	8	4	84
Rickets	23	...	...	23
Tetanus	25	21	11	4
Prematurity	45	32	17	13
Infectious Diseases	76	5	5	71
Congenital Anomaly ...	87	42	14	45
Anæmia	39	5	4	34
Rheumatic Diseases ...	9	3	2	6
Skin Conditions	50	2	...	48
Others	383	80	41	303
Total ...	3,590	1,144	696	2,446

The principal diseases treated in order of frequency were gastro-enteritis, broncho-pneumonia, naso-pharyngitis, bronchitis and tuberculous meningitis.

The principal causes of death were gastro-enteritis, broncho-pneumonia and tuberculous meningitis. Many children were admitted in a moribund condition—often too late for any effective treatment.

Of the 473 cases admitted for police observation, some 300 had to be transferred to the mental hospital, and 24 were attempted suicides of whom 4 died.

THE SURGICAL UNITS

There are three separate Surgical Units one of which deals exclusively with traumatic and orthopædic work.

Unit	Unit Chief	Basic Beds
Surgical Unit 'A' ...	Prof. E. C. Mekie, M.B., C.H.B., F.R.C.S.E., F.I.C.S.	105
Surgical Unit 'B' ...	Mr. H. M. McGladdery, M.B., C.H.B., F.R.C.S.	118
Surgical Unit 'D' ...	Prof. J. A. P. Cameron, M.B., C.H.B., F.R.C.S.	138

In April 1952 the traumatic and orthopædic work was concentrated in Surgical Unit 'D' under the direction of Professor J. A. P. Cameron.

During the year internal reconstruction was carried out in Ward 5 in Professor Mekie's Unit. The improvement is marked and the actual bed space has been increased by 15. Professor Mekie reports as follows:—

The new arrangement has proved a success. There has been a net gain of 15 in the number of beds in the ward. The rooms themselves are much brighter and more pleasant and better adapted to surgical function.

The provision of air conditioning has proved of very real benefit especially in the care of the very ill febrile patient and the toxic goitre.

Criticism that the smaller rooms, at present chiefly employed to house first class patients, lack sanitary facilities has been made. Were this the future function of these rooms the criticism would be serious. It is, however, my intention to employ these smaller rooms as the chief post-operative accommodation for serious cases when the new theatre facilities become available.

New minor theatre. This minor reconstruction has been completed to the great benefit of the work of the unit. The major theatre is in full use and the minor theatre has enabled us to undertake additional work. All minor surgery has been transferred to it and junior staff now carry through in it "set" lists of operations of the lesser major character. While this room has limitations as an operation theatre it has proved extremely useful and well worth the loss of the consulting room.

	1952
Total Admissions	3,324
Total Operations	1,933

There has been a steady increase in the number of 'heavy' cases undertaken during the past year. Cases of this character throw a very considerable burden on the nursing staff. I would wish to express my appreciation of their attention and skill. These 'salvage' operations sometimes appear to be almost 'love's labour lost' but the occasional success is very full compensation. It may be of interest that one such patient whose life was a struggle and a misery due to œsophageal stenosis has been sufficiently relieved and has had her interest so aroused by the attention she received that she has now become one of the hospital nursing staff.

I wish to place on record the debt of gratitude I owe to Col. Clyne, to Wing Commander Klidjain and to Wing Commander Hutter who during the past year have greatly helped both in hospital and in teaching duties.

Mr. H. M. McGladdery was appointed to take charge of surgical unit B in April. Until then it was under the direction of Dr. K. Vellasamy.

Mr. McGladdery reports as follows:—

'Ward 1 Admissions = 2,829 — Average bed situation = 70–75
Ward 2 Admissions = 2,301 — Average bed situation = 50–55
Total operations = 3,119
Surgical out-patients — New cases = 2,102
Repeats = 23,132

'B' Unit uses wards 1 and 2 for males and females respectively. In general these wards are always full . . . it is primarily the number of beds that determines the amount of work done at present. This is not, however, the whole story. If extra beds were provided the theatre would be the limiting factor. There is only one theatre and barely sufficient staff to run it. The present theatre is kept busy all day for 5 days a week and Saturday morning is spent in cleaning. It is usual for the theatre to be working till 6 p.m., or later, at least once and often twice in these 5 days. It is to deal with the above situation that new theatres and wards are to be built to raise our unit to a strength of 150 beds.

As regards out-patients, 'B' Unit has a small out-patient department at the main entrance of Bowyer block. This is now too small and in addition has never had facilities for teaching. It will be replaced by using the new out-patients building.

Two activities need development in the future. These are follow-up of patients after discharge and clinical pathology. Following up every patient who has been in our wards is the only way of checking on our methods of treatment. Without it it is possible to repeat mistakes simply because we do not know the results in previous similar cases.

Clinical pathology is done for us in other departments of the hospital. It is a great advantage for it to be done in the unit itself. This keeps the laboratory worker close to the wards and reminds him constantly of the important decisions which rest in some considerable degree on his laboratory findings.

Professor J. A. P. Cameron assumed control of the Traumatic and Orthopædic Unit in April 1952. In addition to the accommodation occupied by this Unit in the General Hospital this division also includes:—

The St. Andrew's Orthopædic Hospital at Siglap with approximately 80 beds.

The Middleton Hospital Poliomyelitis Wards with approximately 50 beds.

Regular visits were made to these Hospitals and to Tan Tock Seng Hospital where there are adult cases of bone and joint tuberculosis and of traumatic paraplegia.

In the reorganizing of the Orthopædic Unit it became necessary to form regular Fracture and Orthopædic Out-patient Clinics.

This was carried out by:—

(*a*) converting Ward 22 into temporary examination cubicles with couches;

(*b*) making a temporary Plaster Room;

(*c*) installing a small X-ray machine with developing and dark room facilities.

During the period April—December a total of 21,352 out-patients were seen and treated.

During the same period 1,871 patients were treated as in-patients in Wards 17 and 18.

Both the major theatres and minor theatres have been used to the capacity of the nursing staff available.

Total operations performed 7,120.

An old building adjacent to Ward 22 has been repaired and renovated for use as a temporary appliance workshop. A new welding shed has been built as a permanent structure adjacent to the site reserved for the new permanent workshop. Unfortunately the equipping and staffing of these premises will be delayed until 1953.

THE PHYSIOTHERAPY DEPARTMENT

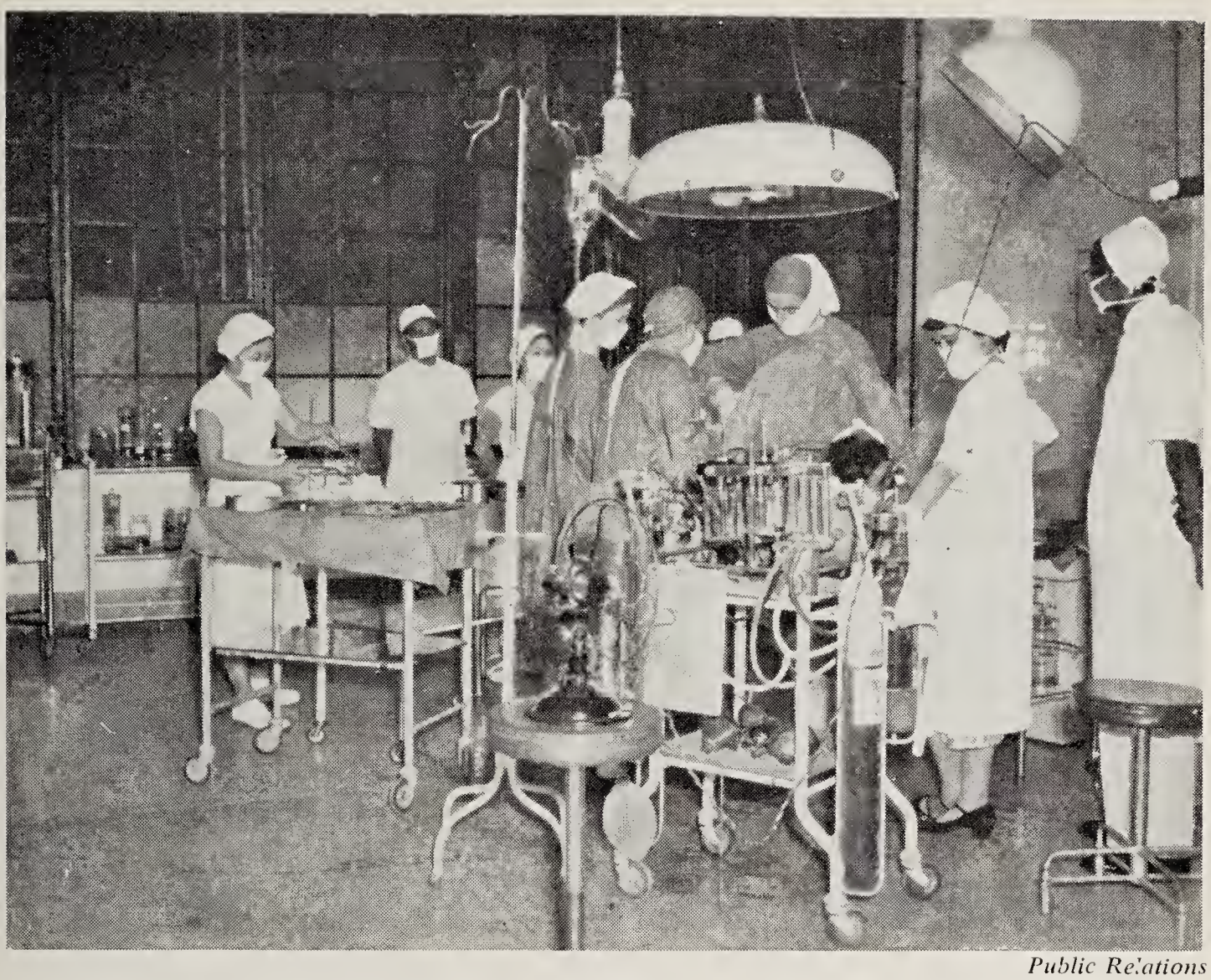
This division is divided into two separate Units, one Surgical and one Medical.

The Surgical Physiotherapy Unit has naturally been closely associated with the Orthopædic Unit and is under the control of Miss McClymont, C.S.D.

The work of the Physiotherapy Division has been closely integrated with the work of the Orthopædic Unit and particular attention has been paid to early movements both active and passive for all traumatic cases confined to bed. With the formation of Fracture and Orthopædic Out-patient Clinics all patients having physiotherapy treatment are kept continually under review. Poliomyelitis cases receive prolonged care and treatment—results have been most encouraging.

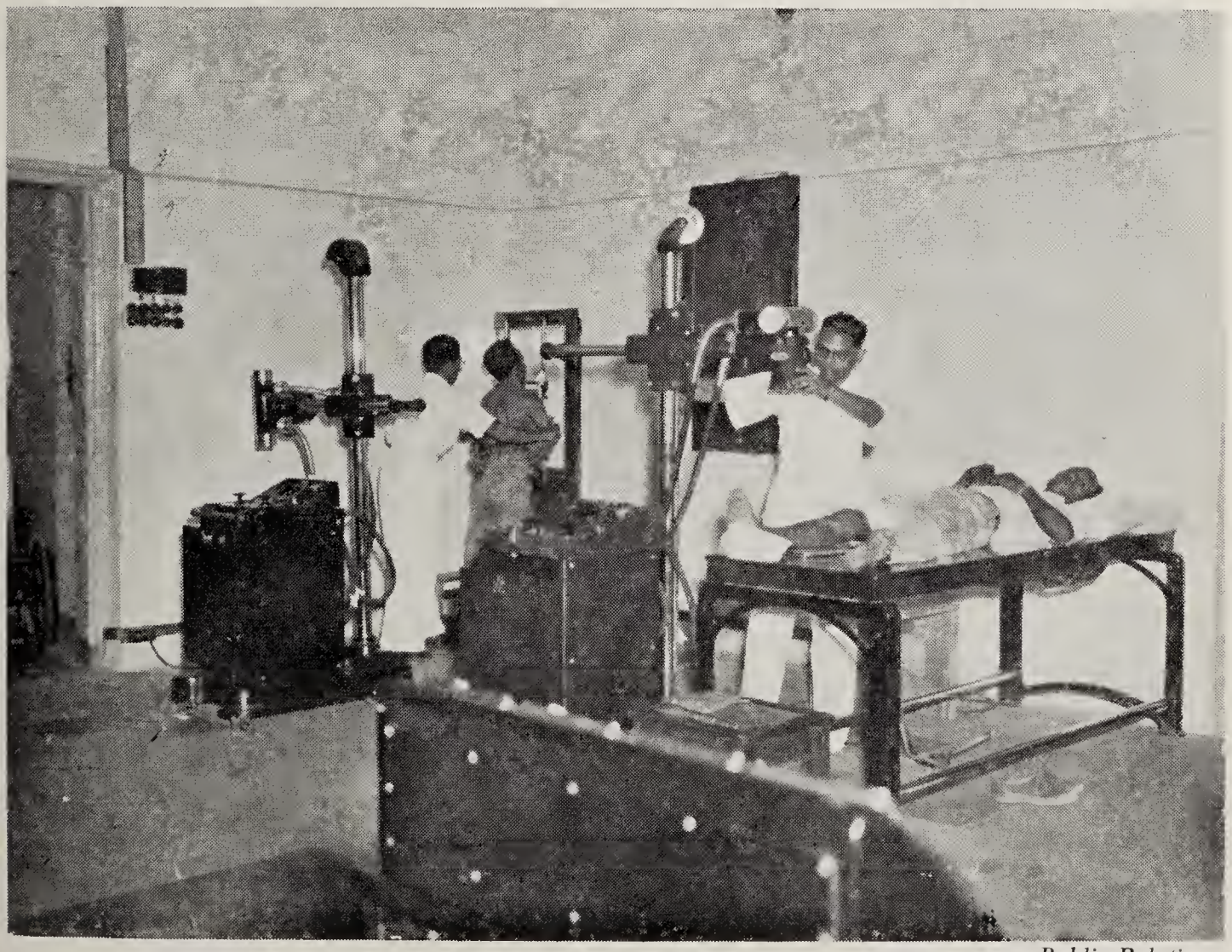
Since the return of Mr. Chong Kow Thye, M.B.E. from study leave in the United Kingdom where he received special instruction, remedial exercises, rehabilitation work dealing with amputees, and gymnastic classes have been held regularly. A gymnastic class is held weekly for the preliminary Training School of Nurses.

The work includes post-operative breathing exercises for chest cases and the rehabilitation of surgical cases in the general surgical units.



Public Relations

General Hospital—An operation in progress in one of the operating theatres



Public Relations

General Hospital—A part of the X-Ray Division

Public Relations

A part of the Children's Ward at the General Hospital

Public Relations

Blood Transfusion Service, General Hospital—British Services Personnel donating blood for the local blood bank

Public Relations

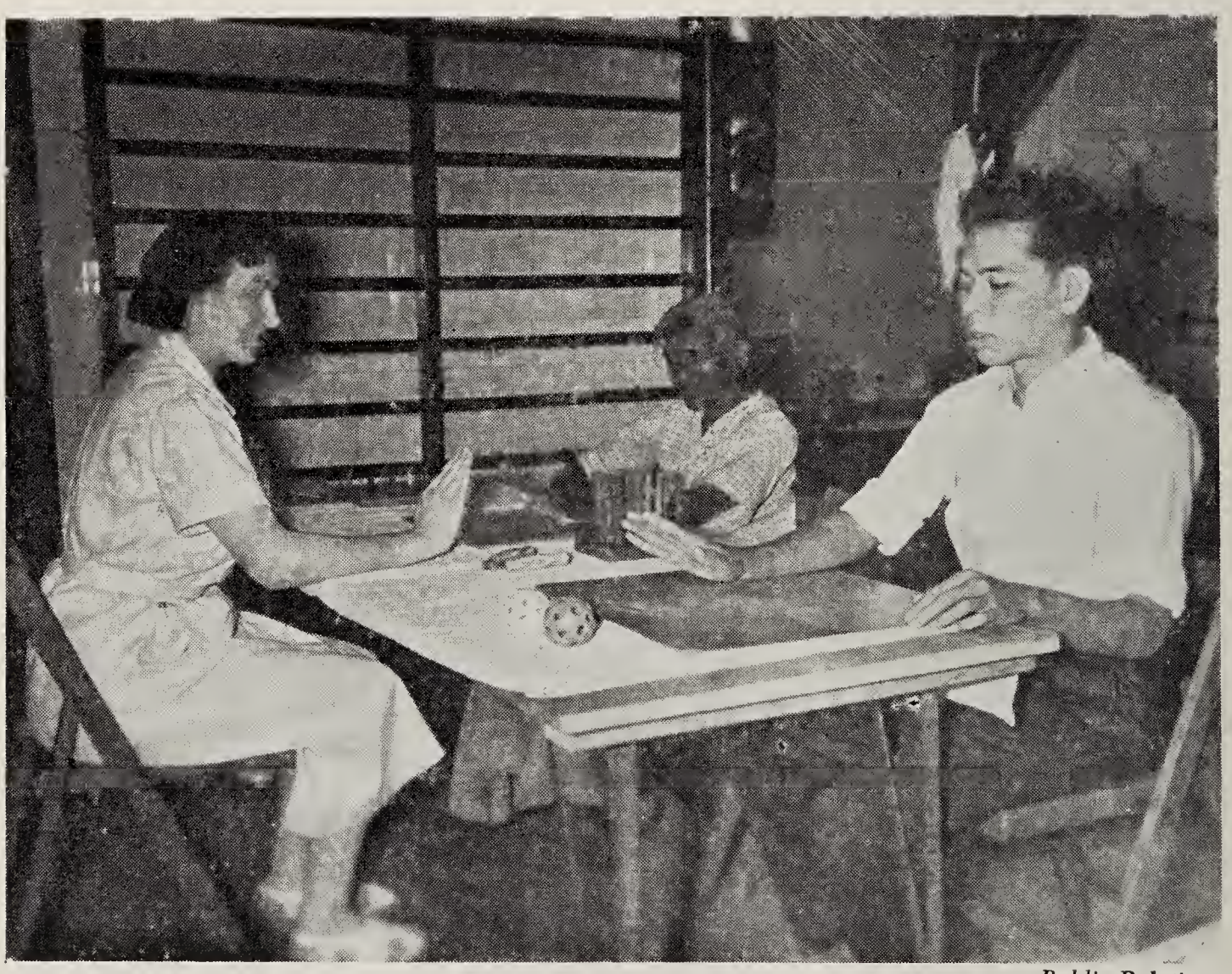
Physiotherapy Department, General Hospital—Children who have suffered from poliomyelitis doing re-education walking exercise

Public Relations

Occupational Therapy Department, General Hospital—Patients being taught brush making

Public Relations

Physiotherapy Department, General Hospital—A view of part of the Department



Public Relations

Physiotherapy Department, General Hospital—Patients who have suffered fractures of the wrist practising to improve movement of the hand

Returns showing the number of treatments:—

Ward cases at the General Hospital	20,488
Out-patients at the General Hospital	8,343
Poliomyelitis cases at the General Hospital, and St. Andrew's Orthopædic Hospital	3,228
Middleton Hospital	19,443
Chest cases in Tan Tock Seng Hospital	3,499
Remedial gymnastics	1,409
Total ...	47,410
New cases	1,762
Poliomyelitis cases	93
	1,855

Medical Physiotherapy is closely associated with the two Medical Units and is under the direction of Miss Uniacke.

During the year the number of attendances totalled 31,530 with 1,711 new cases.

Too much stress cannot be laid on one or other form of physiotherapy treatment in a modern hospital organization. Thereby many patients can be discharged much sooner, and discharged in a condition which will not make them a permanent burden on the welfare services of the State. Instead of remaining helpless cripples they become useful citizens again. This is a new service to Singapore and one of outstanding importance to the public. It will be steadily expanded in consequence.

OCCUPATIONAL THERAPY

This division was re-opened in March 1952 and is naturally very closely associated with the Orthopædic Unit. Miss Burnett, M.A.O.T., is in charge.

There has been a steady progress in the numbers of patients benefitting from Occupational Therapy.

	Patients	*Attendances*
April	20	93
May	24	150
June	28	101
July	30	106
August	41	170
September	48	259
October	63	347
November	64	350
December	48	245

Although most of these patients come for short treatments many attend every day and some for the whole day but such visits are recorded as one attendance. These numbers are made up from both out-patients and in-patients, all being sent for specific remedial treatment. 60 per cent come from the fracture and orthopædic clinic for exercises. The remainder consists mainly of long term medical cases: cases of hemiplegia, paraplegia and burns.

The following figures show the number of patients who received diversional occupational treatment in the wards. This part of the work was looked after by two locally recruited assistants and two part time voluntary helpers. Visits have only been recorded since September.

	New Patients	*Visits*
September	52	986
October	56	1,035
November	66	907
December	60	996

In September a large consignment of new equipment arrived from the United Kingdom including several looms, a potter's wheel, and a treadle wood-turning lathe. A bicycle fret-saw has also been received. The Commissioner of Prisons has kindly lent the services of two trained instructors in bookbinding and boot and shoe repairing.

The importance of teaching a trade to those who have lost their employment through injury is of much value. Some of the patients who have learned these trades will be able to do the work in their own homes, while others may be able to be placed in employment by the Almoners.

With the development of the division, its value as a form of therapy to the Hospital will be realized more and more and used as another means of assisting the patient towards recovery, re-employment and returning to social life.

ST. ANDREW'S ORTHOPÆDIC HOSPITAL, SIGLAP

This hospital is situated at the seaside eight miles east of Singapore City. It has an ideal site and is a model hospital in design for the treatment of bone and joint tuberculosis and other conditions necessitating a long stay in hospital.

It is a children's hospital jointly administered by the Church of England and by Government. There is accommodation for approximately 80 children.

During the year the hospital has been filled to capacity with 70 cases of bone and joint tuberculosis and 10 cases of severe post-poliomyelitis paralysis. There is a long waiting list for admission.

A physiotherapist from the Department attends the hospital regularly during the mornings.

Educational instruction was carried out by voluntary helpers.

Operative surgical and X-ray work was carried out at the General Hospital as required.

MIDDLETON HOSPITAL (POLIOMYELITIS WARD)

Owing to the prevalence of poliomyelitis two wards giving a total of 50 beds have been set aside for the treatment of poliomyelitis during the acute infective and convalescent stages.

A small physiotherapy section has been established and works under direction from the Surgical Physiotherapy section.

Number of beds available	50
Number of patients treated	71
Number of patients under treatment	38

The three surgical units again covered a surprising amount of work during the year, the total operations performed being 14,097 as compared with 9,740 in 1951 and 6,828 in 1949.

THE EAR NOSE AND THROAT DEPARTMENT

Dr. Au Kee Hock, L.M.S., Singapore, E.N.T. Surgeon, is in charge of this department and he reports as follows:—

The E.N.T. department is at present still with the 'B' Surgical Unit. This situation is very unsatisfactory indeed, due to the lack of accommodation and theatre facilities. The unit is on call on alternate days and Sundays and hence the bed situation is acute.

The endoscopic work is done in the E.N.T. office and here again the arrangement is unsuitable. There are no facilities for the after-care of the dilatation cases, and it is a common sight to see these patients coughing and spitting before other out-patients. Audigram and ear testing are at present under a disadvantage, as these procedures are not being carried out in a soundproof room.

	New Cases	*Repeats*
1951	3,167	8,033
1952	4,126	10,541

During the year 1,186 major and 739 minor operations were carried out.

The provision of a separate section in the General Hospital for E.N.T. work is a part of the reorganization and expansion of the hospital under the Medical Plan. It is hoped to complete this scheme in 1953.

THE EYE DEPARTMENT

Mr. A. D. Williamson, M.B., C.H.B., D.O.M.S., F.R.C.S.E., is the Ophthalmic Surgeon in charge of this Department and summarises the work carried out as follows:—

RETURNS OF OPERATIONS FOR THE YEAR 1952

Cataract extractions	469
Broad Iridectomy	22
Optical Iridectomy	27
Iridotomy	12
Iris Inclusion	6
Excision of prolapse Iris	24
Excision with purse string	3
Paracentesis	45
Needling	66
Diathermy for attachment of Retina	9
Squint operation	24
Trainor's operation	2
Toti's operations	18
Excision of Lach. Sac.	21
Mucous Membrane Grafting	53
Skin Grafting	7
Enucleation	47
Evisceration	14
Mc.Reynold's operation	257
Foreign Body Extraction	113
Foreign application of magnet	2
Tarsorrhaphy	8
Chalazion	207
Expression for Trachoma	167
Diathermy for vessels, corneal ulcer and eye lashes ...	192
Diathermy for Prolapse Iris	3
Application of Tonometer	9
Exenteration	4
Marginal Scleratomy	59
Cyclodialysis	2
Linear Extraction	11
Arruga's Operation	24
Various	587
Total ...	2,514

This total is again an increase on any previous year (1,898 in 1951 and 1,170 in 1949).

The up-to-date Ophthalmic division with its compact out-patient section and operating theatres completed in 1948 continued to prove its value. The accommodation is housed on one floor adjacent to its wards and forms a single unit which is probably the most modern and best equipped Ophthalmic Department in existence in this part of the world.

The visit of Sir Clutha Mackenzie, United Nations Adviser on Blind Welfare in April 1952, provided an ideal opportunity for the discussing of long-term plans for the welfare of the blind in the Colony, and on these discussions future action of the Singapore Association of the Blind is to be based.

The registration of the blind has continued throughout the past year and various facilities can now be made available to blind persons on registration. A Voluntary Society has undertaken the home visiting of the certified blind and in addition its members are arranging to bring reported and suspect cases to the General Hospital for medical examination, and registration if necessary.

The funds available to the Singapore Association of the Blind have increased considerably and it is hoped that the Association may soon be in a position to build a nursery for blind babies. In addition plans have been approved for the building of residential schools, and workshops in the future.

During the past year all cases of blindness which had been reported previously but not certified by the Ophthalmic Surgeon have been brought up to the hospital for examination. There are now 272 blind on the register, of whom 69 are below the age of 16.

THE ANÆSTHETIC UNIT

Dr. E. G. Hudson, M.R.C.S., L.R.C.P., D.A., the Senior Anæsthetist reports as follows:—

Establishment

There is an establishment for five anæsthetists in Singapore. At present there are four full time anæsthetists. It is hoped in the near future to recruit one further anæsthetist.

Equipment

There are 10 anæsthetic machines in use, and these are serviced quarterly by Industrial Gases Ltd. Several new machines as replacements are on order.

Below is an analysis of the major anæsthetic procedures administered during 1952.

Operating Theatre	*General*	*Spinal*	*Local*	*Total*
'A' Theatre ...	1,883	183	768	2,834
'B' Theatre ...	1,471	329	585	2,385
E.N.T. Theatre ...	305	—	900	1,205
'D' Theatre ...	604	7	472	1,083
Kandang Kerbau ...	2,463	81	6	2,550
Dental Clinic ...	2,250	—	—	2,250
Eye Department ...	90	—	—	90
	9,066	600	2,731	12,397

Review of work of the Anæsthetic Unit.

During the year there has been an increase in the total amount of major surgery performed and a further development of the more specialised branches of surgery, notably chest surgery. Sixty-three chest operations were undertaken for pulmonary and œsophogeal lesions. In all the theatres except 'D' Theatre, there are operating sessions practically every morning and afternoon and it has been the aim of the anæsthetic unit to provide a trained anæsthetist for every session. The surgeons appreciate the advantage of modern anæsthesia administered by a trained anæsthetist since their work can be performed more rapidly and more easily and post-operative complications are reduced.

The further development of thoracic surgery has been largely due to a specialised anæsthetic technique involving controlled respiration which can only be performed by a trained anæsthetist. For operations requiring muscular relaxation, intravenous muscle relaxants are used in combination with a light general anæsthetic. This technique gives excellent operating conditions and is of particular value in poor risk cases, since a minimum amount of toxic anæsthetic agents is required and recovery from anæsthesia is rapid. During 1952 we have introduced two new muscle relaxants to Singapore, viz. Scoline and Laudolissin to add to the three already in common use, viz. a-tubocurarine Chloride, Decamethonium Iodide, and Gallamine Triethiodide.

DERMATOLOGY

The special out-patient clinic started at the General Hospital in 1950 continued under the able guidance of Major D. Gill of the R.A.M.C. and we are again indebted to the Army Medical Authority for its most valued assistance. During the year 2,708 new cases attended the clinic, the total number of patients seen being 6,454.

The pattern of conditions observed was similar to that in 1951 with eczema/dermatitis the largest group. The scabies clinic continued to carry out its most useful work every Friday afternoon.

THE DENTAL CLINIC

A large part is played by the Dental Clinic at the General Hospital in the present small dental service of the Colony. This is under the supervision of the Professor of Dental Surgery Dr. R. J. S. Tickle.

The general position is set out in the following tables:—

CLASSIFICATION OF NATIONALITIES, 1952

——	Chinese	Indians	Malays	Others	Total
Adults ...	4,341	1,149	681	184	6,355
Children ...	3,144	341	116	98	3,699
Total ...	7,485	1,490	797	282	10,054

Professor Tickle reports as follows:—

These figures show there was a very substantial increase in the number of new patients during 1952. It should be noted that there was also a marked increase in practically all types of dental operations during the year, largely due to the greater number of students in the clinical years.

It is believed that the present Dental Clinic has reached its maximum intake of patients, and it should be observed that there has been an approximately 100 per cent increase in the figure since 1950.

The demand for dental treatment is increasing, and it is now quite normal to have a waiting list for patients seeking emergency treatment and extractions. Under such pressure it is found increasingly difficult to render preventive and conservative treatment. It is difficult to refuse immediate treatment to numbers of infected dental cripples and this situation, in my opinion, can only be rectified by an extension to the existing Clinic and by the building of additional ones.

DIETETICS

The dietetic division has again had a period of lack of continuity in administration as it has been the responsibility of three individuals: Mrs. N. A. W. Cessford, nursing sister on the temporary staff who was in charge until her resignation on 30th April, thereafter Sister O'Donnell until 27th October when the dietitian Miss Dryden took up her appointment in the hospital. Mrs. Cessford was re-appointed to duty in the kitchens on 14th November.

While the practical work of the Department was carried out on the lines laid down in the previous year, it is not possible to formulate a future policy for the organisation and running of the department and most of the difficulties can be traced to the fact that there has never been an adequate number of qualified permanent staff.

DENTAL CLINIC

Year	Patients	Total Visits	Daily Average	Extractions	Fillings	Oral Prophylaxis	Dressings	Dentures	X-Rays
1947	3,973	22,932	57.36	14,600	4,820	1,378	9,760	690	..
1948	3,895	29,355	69.60	15,900	5,200	1,887	11,800	753	..
1949	4,599	38,806	93 86	21,455	5,760	1,715	14,770	1,281	..
1950	5,870	36,868	84.96	25,489	3,388	1,230	12,720	1,451	..
1951	7,149	29,168	60.32	22,973	3,490	702	12,556	1,457	3,571
1952	10,054	37,988	77.33	27,935	5,813	654	10,393	1,223	4,498

Kitchen Staff

The 1952 estimates allowed for the special post of Senior Cook to be established as the necessity for one with greater supervisory powers was realised. This vacancy was filled by promotion of one of the senior cooks on 1st January, 1952.

An additional three attendants for cooking duties were requested on 1st December, as depletion of numbers due to leave and sickness was apt to handicap the work of the kitchens; also, it seemed advisable for more time to be devoted to the preparation of special diets. Permission to engage these extra personnel was given and the total establishment was completed by the end of the year.

Food Supplies

In reviewing the daily records kept during the year it is obvious that unceasing effort has been necessary in the checking and inspection of the food supplies delivered by the contractor to keep up the quality and to see that correct quantities were received.

Regarding the cooked meals served, the main faults lie in the service to the patient, through lack of sufficient heated trolleys. A system in which hot food is loaded into open trolleys and transported considerable distances to the various wards cannot be satisfactory. Improvement in this respect can be anticipated once the full complement of heated trolleys is delivered.

The improvement in the kitchen facilities afforded by added equipment installed over the past two years has resulted in time and labour saving which should be turned to better advantage by further training and instruction of the kitchen staff in improved methods of working and cooking. Continual training in method is considered an essential part of kitchen management.

Meals Served and Cost

Average daily number of meals served from all kitchens ...	1,620
Average daily number of patients (including babies) receiving meals	735
Average daily number of paying patients (*a*)	35
Average daily number of paying patients (*b*)	89
Average daily number of free patients	611

Average daily cost per patient:—

Paying (a)	*Paying (b)*	*Free*	*Children*	*Babies*
$4.92	$3.19	$1.15	$1.68	28 cents

ALMONER'S DIVISION

This service has continued under the direction of Miss Eastaugh who comments as follows:—

During 1952 the Almoner's Division in Singapore has come nearer to achieving its objectives than in any previous year and the almoners have at last proved to themselves that their work here is no longer superficial and advisory.

Added experience and continual awareness of the necessity to attain practical results so that both patients and staff can benefit has meant a constant searching for better methods and the degree of success the almoners have had with individual patients has indicated that even where there is a shortage of statutory and voluntary agencies in the community the case-work need be no less effective. It is now certain that the real foundations of almoning have been laid in Singapore.

The three years' previous experience has played a most important part in the growth of the work, not only in the increase in staff and the ever increasing numbers of patients interviewed, but also in the ability to solve the problems of the patients whose physical conditions and disabilities vary so much in a

community where the racial customs and habits play such a great part in resettlement. This closer contact with the people will be further increased as local recruitment takes place, and a greater variety of races working on the staff within the division can be effectively deployed.

The past twelve months have without doubt shown a complete change in attitude towards the Almoner service and in the relations between the almoner and the hospital staff, and co-operation with the ward nurses and medical officers has been excellent. The junior medical officers have co-operated fully in referring all patients to the almoners: in particular, in the case of those who were in need of social care, they have given the almoners complete information on the prognosis and have done everything possible to help them to promote the health of the patients and their relatives. Many adaptations have been possible so that treatment could be continued in the home and working life of patients, and because of this closer co-operation the almoners have been able to do far more to keep the beds cleared for the more urgent and acute cases in the Hospitals. These junior medical officers all studied medico-social work during their final year as medical students with the almoner in the University Department of Social Medicine and their team work has resulted in more effective results in consequence.

There has been a general and increasing development of the social services for the sick in the community and all the voluntary and statutory agencies have helped. The Social Welfare Public Assistance Section has been fully aware of the problems to be met with in maintaining the patients who attend for treatment. The needs of the acutely sick, of those who are likely to remain ill for a long period of time, of the chronic patient and the dying are all different, and constant liaison with the different committees distributing funds has been maintained.

The Almoner was appointed to the Public Assistance Board during the six months' absence of another member of the Board, and detailed discussions took place on the provision of relief and sickness allowances, and special nutritional grants for those patients needing special feeding. Great progress was made in the direction of giving increased rates of benefit for the acutely sick, but there is always a limitation in the numbers which can be helped because of the total funds which are made available. The families of the chronic sick and the dying are a particular source of worry because of the need of maintaining a subsistence level and of preventing deterioration of health throughout the family unit. It has not been possible to make any provision for rent in the present sickness allowances and a small grant for food which cannot be stretched to cover the cost of essential shelter is often uneconomic to operate. The almoners however have had much more success in 1952 in finding employment, in training and apprenticeships for dependants and young adults, and on the whole it would appear that in the future the opportunities will increase for making families self-supporting.

It has been found in Singapore that most of the available charities are administered by one group of committee members and the principles governing the distribution of the funds are therefore usually the same. This is a great disadvantage, as when faced with certain family difficulties, the almoners would prefer a much wider distribution of power amongst the endowed charities and voluntary bodies. Administratively, it is of course much more difficult to deal with several voluntary agencies, but such a scheme has a far greater opportunity of developing spheres of specific activity, when the problems presented indicate that new methods can be tried.

During the year a special grant from Government was made to meet the cost of all the artificial appliances supplied to both in-patients and out-patients. Those patients who have sustained injuries and have fallen victims to disease requiring amputations remain in a somewhat unfortunate position, and at the present moment the almoners are having difficulty in obtaining money to supply sufficient artificial limbs. The degree of social distress caused by the delay in supplying such limbs does not seem to be appreciated, although it is quite apparent that a man cannot return to work while on crutches. To be unemployed and to have no definite time limit of when he will be able to return to an earning capacity is an added and unnecessary mental strain on a man with a family who has already suffered the physical disadvantage of being unable to walk unaided. A patient who has had an amputation is not restored to his full work capacity until he has been supplied with an artificial limb. At the present moment most of these patients are receiving relief out of Public Assistance funds for themselves and their families and also the sickness allowance available for disabled persons. Some are accommodated in Bushey Park Home for destitutes, receiving full maintenance and pocket money from Government sources.

The student training programme has also made an important advance during the last four months. Our first locally trained almoner has now gone to the United Kingdom for a 2 years post-graduate course. Another local student has done the first 6 months practical training after having completed her University Social Science Course in New Zealand and will be qualified in practical work in another 5 months' time. The University of Malaya is helping us to achieve our objective in the training of local girls in almoning. The University Social Science Course gives a 2 years training for generalised social work, but the Director of Social Studies and the Almoner have confirmed a programme for those who specially wish to work as almoners so that they can be recruited direct into Government Service at the end of their training. This University course is the real beginning of the training of almoners in this Colony and should form the basis of all recruitment. The locally recruited almoner will be able to bring the more experienced expatriate staff into closer contact with the various races and must play an ever increasing part in the development of welfare and rehabilitation facilities for the sick and the disabled members in the community.

CHAPTER EIGHTEEN

TUBERCULOSIS

TAN TOCK SENG HOSPITAL

TUBERCULOSIS was again the most important communicable disease in Singapore and it continued to receive very considerable attention in the public press. The work of the Division has been expanded steadily from year to year over the post-war period and 1952 was no exception although no more beds could be added. These will be raised from the present 500 to 1,100 under the Medical Plan. Bed accommodation is now five times the pre-war figure in this connection; the present Government effort is many times that of any previous decade.

The most prominent landmarks of progress in the tuberculosis field during this year were the opening of the Royal Singapore Tuberculosis Clinic of the Singapore Anti-Tuberculosis Association by Her Royal Highness the Duchess of Kent on 3rd October, 1952, and the formation of the Singapore Tuberculosis Home Association to set up a home for chronic tuberculous cases who are destitute.

While this chapter is of necessity largely a report on the Government's work in the control of tuberculosis, acknowledgment must be made to the increasing part played by the Singapore Anti-Tuberculosis Association in its valuable contribution in the propaganda field on the one hand, and in diagnosis and out-patient treatment at its Clinic on the other. With the opening of the new Clinic, the capacity of the Singapore Anti-Tuberculosis Association Treatment Centre will be considerably increased. It is also planned to start up a culture laboratory to assist in diagnosis and control in the near future.

At the end of December 1952, the Singapore Anti-Tuberculosis Association had 2,700 cases under treatment. The number of X-rays done from January to December was some 50,924 and number of attendances some 138,872. This represents a very formidable contribution in the field of diagnosis and treatment.

Tan Tock Seng Hospital continued its role as the main Government Tuberculosis centre. The Out-patients Department situated in the Rotary Tuberculosis Clinic given by the Rotary Club of Singapore in 1949 increased its ability to cope with the steadily rising number of tuberculosis patients by instituting regular afternoon sessions in addition. In 1952 a further 3,401 new cases were referred to the hospital for assessment and treatment. Of this total 2,028 were proved to have active pulmonary disease and were given the appropriate treatment. This compares with the 1951 total of 2,509 new cases for assessment of which 1,936 were confirmed as tuberculous and most of whom, of course, are still attending. The total number of out-patients in regular attendance is now over 5,200. Some 14,500 cases have passed through the centre since 1946. Of the out-patients who come to the hospital many of the most advanced continue for a short time only as their request is always for admission, and quite a number cease to attend when they discover the long waiting list. Of those in regular attendance most are in receipt of some form of active therapy. Out-patient attendances including the contact clinic numbered 104,365 for 1952.

In January 1952, Dr. C. E. Smith who had recently returned from study leave in the United Kingdom came to work in Tan Tock Seng Hospital. The out-patients and in-patients divisions were then divided into two units of equal size, one under Dr. R. J. Grove-White and the other under Dr. C. E. Smith. The out-patients' time-table was revised so that each unit held three full morning and three afternoon sessions per week, and in addition one contact session for each.

Proper assessment has continued as an increasingly important and time consuming aspect of our work. In the past, few cases ever came to the hospital unless they had some symptoms or signs relating to chest disease. Now due to the general availability of checks and X-rays at Government institutions and at the Singapore Anti-Tuberculosis Association, and as Government, the City Council and many private firms have also instituted routine X-ray pictures as part of the general physical examination of all recruits to the service, large numbers of cases are being detected and so have thereby swelled the roll of those under treatment.

Radiologically it is often impossible to distinguish between the active and the arrested lesion. While it is very important to avoid unnecessary treatment of cases who do not require it, there is the very important danger of labelling a healthy man as tuberculous on insufficient evidence. In consequence there is a serious risk of developing a new class of the population which may be accurately termed as 'the X-ray unemployable'. Quite apart from the fact that the present volume of work and the duration of treatment are such that the resources of our existing services are severely over-taxed, the routine procedure on the investigation of radiological pick-up cases in the absence of symptoms is to regard them as inactive unless evidence either of radiological progression, of bacteriological, of clinical or of symptomatic advance is forthcoming. Once the activity of such a case is established it is then transferred to the general register for treatment.

In view of the fact that tuberculosis continued again to attract special attention, pressure was exerted to expand the work of this Division of the Medical Services far beyond the scope envisaged in the Medical Plan and far beyond the possible capacity in staff, accommodation and finance in the foreseeable future. Taking all existing circumstances into consideration, tuberculous work has been expanded to a remarkable extent over the post-war period. Present out-patient and in-patient treatment is beyond any comparison with any previous decade. Chest X-ray examinations at Tan Tock Seng Hospital alone came to 26,522 out of a total of 40,829 chest examinations for the whole service. This compares with a total of all X-ray of only some 21,000 in 1948 and 6,000 in 1938.

The main effort by Government has been directed to treating those cases in which the disease can be arrested. Not much has been attempted for the hundreds of very advanced cases for whom nothing satisfactory with our available resources at present can be done. Admission of these patients into hospital accommodation, and the institution of modern treatment and good diet, inevitably mean a rapid increase in the proportion of chronic wards and reduction in accommodation available for treatment cases.

At present nearly one million dollars is being spent each year on treatment allowances for treatable cases, and this is only the beginning. In the near future Government's annual commitment on tuberculosis control in all its aspects will reach the $3\frac{1}{2}$ million dollar mark, and this is quite apart from the very considerable capital expenditure on expansion of the service in the foreseeable future.

Crude deaths and death rates from pulmonary tuberculosis show a considerable decline since the liberation in 1945, and a striking improvement over pre-war figures. Taking the 1939–41 death average as 100 (2,288 per million), the 1947 index was 68 (1,550), 1948, 65 (1,491), 1949, 57 (1,315), 1950, 52 (1,193), 1951, 48 (1,096) and 1952, 39 (888). These figures have been subject to criticism as a proportion of deaths are still not certified by a qualified medical practitioner. It is more than probable, however, that deaths from other causes wrongly entered as pulmonary tuberculosis outnumbered mistakes the other way round. In consequence this decline can be safely taken as actual.

WORKS AND BUILDINGS

During the year the Public Works Department converted one ward for use as a hostel for assistant nurses and installed in it an air-conditioned room for the night staff. No progress was made during the year on the general plan for the development of the hospital, as the priorities in the Medical Department had to be given to the General Hospital. At the close of the year, however, the X-ray Department was remodelled and expanded and as a result will be able to deal with a considerably larger number of cases. The new General Electric X-ray equipment arrived in time to be installed at the close of the year.

SCHOOLS HEALTH DEPARTMENT TUBERCULOSIS STATISTICS

While these are stated in detail in Chapter 13 of this Report the following is a summary from the school figures for 1952:—

Normal radiologically	3,382
Active adult type with positive sputum	7
Active adult type with negative sputum	34
Arrested	25
Active primary complex	346
Healed primary complex	112
T.B. of spine or bones	7
Pleurisy and glands	5
Under observation	551
Total school children X-rayed ...	4,469

Thus 48 cases comprised what is ordinarily understood as tuberculosis from this group, or 1.07 per cent. 0.16 per cent had a positive sputum.

Non-pulmonary tuberculosis appears to have shown a slight increase over recent years although the number of cases is small. This form of the disease is more usually associated with the use of fresh whole milk and this is not a common practice here. The introduction of more cows and the use of more fresh milk must, however, be kept in mind in this connection. The greatest care must be taken that all herds are free from tuberculosis in view of the fact that infection from this source is not thought to be a problem so far.

Notification of the disease appears to have been a failure up-to-date. Whether it can be established on a sufficiently satisfactory basis in such a community as this at the present time as to be of any value is a question which has to be carefully considered. Dr. Morland, a visiting Tuberculosis Specialist from the United Kingdom, was of the opinion that compulsory notification could not be effective without far-reaching economic security measures.

ADMISSIONS

In-patient admissions for tuberculosis in the Government Hospitals in Singapore during 1952 are set out in the table below. These do not take into account the short duration of stay of those cases admitted to the General Hospital as medical emergencies, and later found to have tuberculosis, nor many of the 380 Tan Tock Seng Hospital cases admitted for phrenic crush operations which are in most cases done on patients specially admitted for a few days for that purpose.

	In-patients
TAN TOCK SENG HOSPITAL	
Tuberculosis	
Pulmonary	1,469
Disseminated	13
Bones and Joints	18
Other Forms	4
CIVIL GENERAL HOSPITAL	
Pulmonary	596
Disseminated	64
Bones and Joints	209
Other Forms	259
ORTHOPÆDIC HOSPITAL	
Bones and Joints	73
Other Forms	62
Total number of In-patients admitted to the above Institutions	2,767

Some 1,300 tuberculosis cases, mostly very advanced, seen in the out-patients division could not be admitted for necessary in-patient treatment. All cases coming to the Rotary Out-patient Clinic are registered and treatment started as out-patients. Admission is made from the waiting list of these patients according to their various priorities on medical and social grounds.

It will be seen that the 104,365 attendances in the Tan Tock Seng Out-patients Division in 1952 was a record and some eight times that of the 1948 period. The Rotary Out-patient Clinic opened by H. E. the Governor in April 1949, as a gift from the Rotary Club of Singapore, is to a great extent responsible for this, but the steady increase in the numbers coming forward has now taxed even this excellent and modern accommodation to the utmost. Certainly the increased staff available has been stretched to the limit to deal with present numbers. Out-patient demands must be expected to increase, however, until more beds are available. Further accommodation is now a matter of real urgency.

IN-PATIENTS AND OUT-PATIENTS STATISTICS FOR TAN TOCK SENG HOSPITAL

In-patients	*Total treated*	*Deaths*
Respiratory Tuberculosis	1,469	156
Other Diseases (mostly chronic)	499	73
Other Tubercular Diseases	35	6
Total	2,003	235
Percentage	11.73	

Out-patients	*New Cases*	*Repetitions*
ROTARY T.B. CLINIC		
T.B. cases	2,028	93,325
Assessment cases	1,373	—
GENERAL O.P.D.		
Non-T.B. cases	4,632	11,721
Leprosy cases	238	10,412

TAN TOCK SENG HOSPITAL

RETURN OF WORK DONE—ROTARY TUBERCULOSIS CLINIC, 1952

—	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1. Number of New T. B. Cases ..	138	165	154	136	145	178	156	168	164	175	174	148	1,901
2. Number of Repetitions ..	6,246	6,517	6,561	6,713	7,517	7,025	8,409	7,700	8,307	8,833	8,676	9,880	92,384
3. New Assessment Cases (Z) ..	32	48	50	57	49	54	88	60	57	85	73	60	713
4. New Assessment Cases (S) ..	37	52	46	36	49	61	76	43	51	81	58	70	660
5. X-ray Examinations	1,966	1,828	2,173	2,016	2,942	2,570	3,307	2,042	2,381	2,930	2,153	747	27,055
6. Fluoroscopic Screenings ..	624	602	649	655	678	570	638	584	628	671	642	694	7,635
7. Laboratory Examinations ..	3,994	4,200	4,139	4,117	4,099	4,155	4,413	4,155	4,259	4,224	4,179	4,124	50,058
8. Dispensary Routine Issues ..	4,253	4,181	4,286	4,375	4,598	4,172	4,973	4,572	4,782	5,256	5,758	5,664	56,870
9. P. A. S.	558	513	582	568	617	564	580	622	698	780	878	1,131	8,091
10. Thiacetazone	355	393	417	410	453	368	376	273	305	335	390	402	4,477
11. Streptomycin Injections ..	1,088	1,632	1,952	1,728	2,304	2,144	2,208	2,336	2,080	2,656	2,304	3,264	25,696
12. A. P. Inductions	..	..	..	..	..	4	2	..	..	..	..	..	6
13. A. P. Refills	166	125	119	143	147	118	127	117	117	119	108	87	1,493
14. P. P. Inductions	54	51	96	62	47	34	40	32	29	40	48	39	572
15. P. P. Refills	3,149	3,007	3,211	3,332	3,517	2,900	3,339	3,051	3,290	3,486	3,463	3,863	39,608
16. Aspirations	28	39	39	14	18	8	25	15	12	30	27	36	291
17. T. B. Specialist Consultations (Z)	..	..	..	136	528	501	680	439	699	628	600	538	4,749
18. T. B. Specialist Consultations (S)	..	..	..	148	497	508	678	571	532	641	741	626	4,942
19. Home Visits for T. B. ..	412	553	618	480	564	353	662	452	616	475	544	561	6,290
20. 1st Home Visits to Contacts ..	47	114	116	82	134	76	138	145	143	110	117	103	1,325
21. 2nd Home Visits to Contacts ..	398	357	392	321	380	189	318	261	261	323	291	244	3,735
22. Tuberculin Jelly Test	42	94	87	68	102	50	97	98	87	81	83	74	963
23. Jelly Reading Done	42	86	95	68	88	64	97	91	94	81	83	74	963
24. Contacts at Clinic—1st Attendance	65	73	89	87	73	64	97	78	80	78	72	3	859
25. Contacts at Clinic—2nd Attendance	213	192	277	217	264	197	294	314	290	354	380	101	3,093
26. School Children—New ..	6	8	14	13	9	8	9	4	5	9	3	1	89
27. School Children—Repetitions ..	39	47	80	63	112	50	67	84	60	53	49	48	752
28. School Children—T. B. Contacts	13	19	31	12	17	16	20	25	18	35	28	23	257
29. School Children—T. B. Revisits ..	15	21	35	28	27	33	28	39	60	67	67	60	480
30. Teachers—New	1	5	3	5	3	6	4	2	..	8	..	1	38
31. Teachers—Repetitions ..	19	32	29	18	15	15	9	15	9	16	4	8	189
Total ..	24,000	24,954	26,340	26,108	29,993	27,055	31,955	28,388	30,114	32,660	31,993	32,674	346,234

It is somewhat difficult to judge accurately the work of our Tuberculous Out-patients Division in comparison with clinics elsewhere, as different clinics employ different methods in enumerating the services given to patients and so assessing the work done. The table given here shows a total of 346,234 individual services and it can be seen that the work in the Government Clinic steadily increased throughout the year in almost all divisions. Drugs have been enumerated as individuals on a particular drug during each month, with the exception of Streptomycin injections which in every case represent the number of injections given during that month; the average number of injections received by any patient in a month was eight.

Tuberculosis is present without doubt in a higher proportion of Singaproe's population than in that of the United Kingdom where some 700 beds are available per million as compared with some 500 in Singapore. Well over 3,000 beds would be required to deal with our problem completely and ideally, but even the 1,100 envisaged under the Medical Plan will take us quite a long way along the proper path, particularly with the added and considerable out-patient facilities contemplated in various directions. (General, School Medical, Singapore Anti-Tuberculosis Association, Rural Clinics and so on).

During 1952, Mr. H. M. MacGladdery, F.R.C.S., was appointed Senior Government Surgeon to the General Hospital, Singapore. He paid one visit every week to Tan Tock Seng to discuss cases and perform bronchoscopy examinations. A total of 74 bronchoscopies were performed between August and the end of the year. In addition, Mr. Yeoh Ghim Seng, F.R.C.S., of the Government surgical unit came over to the hospital each week to operate on patients requiring surgical procedures such as herniorrhaphy, phrenic crush and re-crush operations, etc. Straightforward phrenic crushes were carried out by the medical staff of the hospital. A total of 752 operations were performed.

When Professor D. E. C. Mekie returned from leave in September, he resumed his assistance on the surgical side by taking patients for thoracoplasty and resections in his wards in the General Hospital. Seventeen such operations were done during 1952. The setting up of a separate chest surgery unit was discussed with Professor Heaf on his visit here.

ADMISSION OF CHRONIC CASES

The Chinese Advisory Board recommended the formation of a new association under their auspices towards the end of the year to build an institution for the reception of advanced cases of tuberculosis. The association was formed in December 1952 and started to collect funds for this purpose. There are three *ex officio* members of the Council, the Director of Medical Services or his representative, the Secretary for Social Welfare or his representative and the President of S.A.T.A. or his representative under the constitution of this new body. This will ensure that close liaison is forged between the Singapore Anti-Tuberculosis Association and the Government tuberculosis service and maintained.

It is intended that a start should be made on one hundred beds but in view of the large numbers of advanced cases desiring admission a very much more extensive institution will be required before the problem is coped with adequately.

EXPERIMENT ON ANTIBIOTICS

During 1951 out-patient treatment with Streptomycin and P.A.S. was instituted. This was carried on into 1952 and the experiment was controlled by the Bacteriology Department of the University of Malaya which did culture tests for Streptomycin resistance using the same methods for standards as that described in the Veterans' Administration Report at the 9th Streptomycin Conference. Over 300 cases in the series were tested and it was found that resistance developed with the dosage used at Tan Tock Seng Hospital in 10 per cent of all cases. As the type of case treated was often most unpromising these figures can be regarded as satisfactory as there was no doubt that the benefit accruing to the patient was very considerable. The course used totalled 68 G. of Streptomycin given in two bi-weekly injections of 2 G. each with 12 G. of P.A.S. given orally in tablet form.

By the middle of the year the University of Malaya wished to close this experiment and the same method of treatment has been continued since but without the same careful bacteriological control.

The arrival of Isoniazid (Nydrazid) Rimifon in 1952 called for further experiment and in the first series of cases on this drug it was used alone. The analysis of 38 such cases is given below.* It must be realized that these figures are not very large but they do indicate that in Isoniazid we have a powerful chemotherapeutic agent. The increasing literature on the subject refers in particular to the rapid appearance of resistant strains. So Isoniazid is now used only in combination with Streptomycin with or without P.A.S.

———	*A*	*B*	*C*	*D*	*E*	Total
Clinical Change						
Marked Improvement ..	1	..	2	..	2	5
Moderate Improvement ..	2	1	4	1	1	9
Slight Improvement ..	..	5	6	3	..	14
No Change	..	2	4	2	..	8
Slight Deterioration ..	1	..	..	..	..	1
Moderate Deterioration ..	..	..	..	..	..	..
Marked Deterioration ..	..	1	..	..	..	1
						38
Radiological Change						
Marked Improvement ..	2	..	5	..	..	7
Moderate Improvement ..	1	..	4	1	..	6
Slight Improvement ..	1	..	3	..	..	4
No Change	..	8	4	2	2	16
Slight Deterioration ..	..	1	1	2	..	4
Moderate Deterioration ..	..	..	..	..	..	..
Marked Deterioration ..	..	1	..	..	..	1
						38

*These cases were divided into 5 groups:—

(*a*) hæmatogenous or bronchogenic spread;

(*b*) chronic fibro-cavernous phthisis;

(*c*) acute active disease, either exudative lesion or principally tension cavities;

(*d*) advanced extensive disease, actively progressive;

(*e*) extra pulmonary.

Public Relations

The Nurses Preliminary Training School

The Nursing Training School

Public Relations

Nurses practising on a dummy patient in the Training School

Public Relations

A demonstration by the Singapore St. John Ambulance Brigade

HEALTH VISITOR'S DEPARTMENT

Work in the Health Visitor's division has continued and the numbers have increased to 11,350. In order to cope with this increase, two sessions have been set up, one for the contacts of each unit. These are managed on a unit basis. It is unfortunate that in March 1952, a Health Sister finished her contract and decided to return to South Africa as up to the end of the year no suitable replacement had been obtained. In other respects this division continued upon the lines outlined in the 1951 report.

A Contact Clinic is operated in and from the Rotary Clinic, Tan Tock Seng Hospital. The Health Sister and Nurses work in close liaison with the Lady Almoner's Department, and it is from that Department that the Clinic is advised of the names and particulars of all curable cases in receipt of T.B. Treatment Allowances.

On the initial visit to a patient's home, advice is given on diet, sleeping accommodation, isolation of utensils, disinfection and disposal of sputum. Adult contacts are referred for X-ray, and school-going children are referred to the school clinics. All children not attending school are tuberculin jelly tested, negative reactors receiving Mantoux or a Moro test after an interval of one month. If still negative they are given B.C.G. vaccination. All positive cases resulting from any of these tests are referred for X-ray. All infants under twelve months are referred to the Infant Welfare Department, together with the results of their tuberculin tests. They are kept under supervision and receive regular visits by the staff of that Department. Child contacts are referred to the nearest feeding centre so that they may avail themselves of the extra food provided.

Visits to patients are continued at two-monthly intervals until the patient is certified as fit for light work by the medical officer in charge of the case. Two or three further visits are made during the following six months in order to ensure that there is no relapse. Cases which are reported by the medical officer to be deteriorating or un-co-operative in following the prescribed home treatment are visited more frequently.

Taken over the whole of 1952 the average number of new 'T.B. Allowance' cases referred to the Department each month was approximately 75, but the figure taken over the last three months was some 95 per month.

Up till March 1952, when the Health Sister left, the staff of the Rotary Clinic consisted of one Health Sister and three Staff Nurse Health Visitors. The grant of transport allowance in July 1951 has enabled this staff to increase the number of visits made by about two hundred cases per month. The total number of visits made to cases and contacts during 1952 was from 10,000 to 11,350. Approximately 10 per cent of the home visits were done in the Rural area, the remainder being confined to the Urban area.

Contacts of far advanced or incurable cases are not at present investigated because the staff and equipment are worked to full capacity in supervising 'T.B. Allowance' cases. A few exceptional contacts of far-advanced cases have been referred for investigation by the medical officers or the almoners and over 13 per cent of these have been found positive to tuberculin jelly test. Due to the run on the X-ray facilities available it has been necessary of late to restrict the numbers of adult contacts referred for X-ray examination in favour of contacts of open T.B. cases.

Tuberculosis Specialist and Medical Superintendent:
Dr. R. J. Grove-White, M.D. (Dubl.), M.R.C.P. (Ed.).
Chest Physician:
Dr. C. E. Smith, L.M.S. (Singapore), T.D.D. (Cardiff).
Chest Physician:
Dr. (Miss) G. E. L. Cummins, M.B., M.R.C.P.

ALMONER'S DIVISION

Miss S. Graham reports as follows:—

During the year 1952 there has been a steady increase in the numbers attending Tan Tock Seng Hospital and this has been reflected very markedly in the numbers passing through the Almoner's section for various forms of assistance. Now, three years after the establishment of the division, it is recognised as a service by means of which patients can bring their many and varied difficulties, and from which they can obtain sympathetic consideration and assistance. The Welfare Fund mentioned in the 1951 report has received considerable support from various sources and so has been able to meet the demands made on it.

A very considerable part of the Almoner's work in connection with the tuberculous patient is concerned with seeing that he and his family have adequate means to carry out the prolonged treatment which is so necessary. The T.B. allowances given under that scheme have been invaluable in this respect, and the monthly report has been of importance in maintaining close contact with the patient, and advising on his personal difficulties. Owing to the rising cost of living these allowances have fallen below the level required to provide the patient with a fully nourishing diet. They do however provide a subsistence allowance which relieves the patient of the need to work.

There are still many patients who do not qualify for the 'allowance' however, in view of the advanced condition of their disease. These are the chronic open cases which are so often the source of infection in the crowded tenements. They can only receive lower rates for relief and for sickness. It is impossible to exist on these if they are living alone and the Almoner's help is often required. Many are unable to pay their rent and as their sickness advances the chief tenant is only too glad of the excuse to drive the sufferer out of his house. Others become too weak to care for themselves, and neighbours, fearing the disease, often ignore their pleas for assistance. The Almoner has constantly to visit these patients' homes to assess the true position, to try and gain the co-operation of the other occupants of the house in their care, to enlist the aid of other organisations, and in many cases to use the Welfare Fund at her disposal to avert the disaster of eviction on to "the five foot way". All too little can be done with the facilities available in Singapore, and some form of home nursing, if only the rudimentary care, is urgently needed.

One of the more hopeful signs in the future care of the chronic and advanced case lies in the establishment of homes run on a voluntary basis. The Taipoo Kheks, the Hylams and the Cantonese have for a long time maintained such places, and throughout the year the Almoner's department at Tan Tock Seng hospital has worked in very close co-operation with the Khek and Hylam homes to improve the facilities for tuberculous sufferers there. Through the department hot meals have continued to be supplied daily to all patients who wished for them, and they have paid only a proportion of the cost. At the request of the Almoner the City Council inspected the premises of the Hylam hospital and subsequently raised the licensed number of patients to 36. There is now a waiting list for admission.

The Sick Bay at the Singapore Harbour Board has continued to be of great assistance in the care of tuberculosis patients on its staff, and the Almoner has visited the patients there regularly and acted in close liaison with the Welfare Officer of the Board. The Harbour Board's organisation is one which could well be followed by other large employers: especially by those whose workers are living in crowded labour lines.

The Almoner attended the first public meeting of the Singapore T.B. Home Association which was held towards the end of the year. It is very much to be hoped that this Home will be established in the near future as it is urgently needed. The Indian Community have also founded a Committee and begun to take action for the building of a separate home for the Indian destitute sick, including tuberculosis sufferers. In view of this the $1,500 held in trust for such a home by the Almoner has been transferred to this Committee.

The major social problem in regard to tuberculosis continues to be that of re-employment. With new drugs and the 'allowances' given, increasing numbers of patients are becoming fit for light work. Their general standard of education and lack of specialised skill makes it extremely difficult to find suitable openings. Many large employers have been co-operative however. The Army has been particularly helpful about taking on ex-tuberculosis patients when they have suitable vacancies. There still remains the fundamental difficulty, however, that many are only used to heavy labouring. As yet there is no training establishment attached to the Labour Department, and its efforts to place disabled persons for training has had only limited success.

The Almoner has to struggle to find jobs for patients by using every contact at her disposal, but the number is too great for this to be a satisfactory method. These difficulties will continue until a special scheme of employment for disabled people is formed. Possibly sheltered workshops could be established to perform certain duties, for instance, maintaining and repairing P.W.D. furniture, and Government could deal with a certain percentage by reserving certain jobs for such disabled persons. There is urgent need for post-hospital training for selected suitable men. This might well be started as an experiment in connection with the Junior Technical School. It is vital though that the trainee and his family should be adequately supported during the training, and assured of employment on completion of the course. So close co-operation by and with industry would be required.

Housing continues to be a major tuberculosis problem with little possibility of solution in the near future. Many patients have been assisted in applying for Singapore Improvement Trust accommodation.

During the year the pressure on beds has necessitated a fairly quick turn-over of patients for a T.B. Hospital and so of course this has meant a greater burden of work. Many single patients do not retain their room on admission and when fit have nowhere to go. Some advanced cases on admission improve considerably but unfortunately develop into infectious chronics, who are only fit to live outside the hospital provided they do not live in close proximity with the healthy, and provided they have adequate food. Some might even manage a light job. These and many other problems come to the Almoner.

The care of the non-tuberculous chronic in Tan Tock Seng hospital is also a matter of grave concern. The provision of a home for the blind by the Blind Association will provide for these otherwise fit people who are at present occupying hospital beds; but there still remain other types of deformity which render the sufferer unable to sustain himself in the outside world although not in need of detailed medical care.

Various experiments have been tried out in the past year. With the assistance of a voluntary teacher, classes were commenced for the in-patient children. These were greatly appreciated and helped to keep the children resting. A supplementary feeding scheme for the active primary child case was commenced. This was limited to those whose family income was too low to provide adequate nourishment, and who did not qualify for the school feeding scheme. The Red Cross voluntary workers have generously given of their time in administrative duties in this connection.

The appointment of a second Almoner in June has been invaluable in all this essential expansion. During the year a student almoner came on for full time training, and several ex-patients have been employed on the Staff. After due time it has been possible to recommend the latter for better positions.

TUBERCULOSIS TREATMENT ALLOWANCE SCHEME

This Scheme was continued on much the same lines as previously during 1952, only slight modifications of the rates being made.

Dr. Grove-White reports on it as follows in a paper prepared for a W.H.O. Conference on Tuberculosis:—

Following on the liberation of Singapore in 1945 it was soon obvious that tuberculosis was one of the major problems confronting the medical authorities. As an expedient a temporary two hundred bed hospital was opened in Katong, a seaside suburb of Singapore. With the rehabilitation of the Government hospitals following the recovery of the Civil General Hospital from the Military Authorities in May 1946 the temporary premises were given up and the patients were transferred to the Tan Tock Seng Hospital, which, up till then, had been a General Hospital.

Before the war only a token number of beds (75) in Tan Tock Seng Hospital were allocated to advanced tuberculosis patients. There was also a ward in the General Hospital available for treatable cases. From this a small out-patient clinic was operated. The greater part of the tuberculosis problem was untouched. Curiously enough it was during the Japanese occupation that the local population became increasingly aware of the value of Western medicine and with the liberation the increased public demand for hospital treatment emphasized the problem of tuberculosis and created a demand for a tuberculosis service and this developed round the 200 bed nucleus in Tan Tock Seng Hospital. An out-patient clinic was started and by the end of 1947 it had over 1,000 patients in regular attendance. At about the same time the Singapore Anti-Tuberculosis Association was formed as a private organization to combat tuberculosis.

It was obvious that the in-patient treatment of the majority of the patients seeking assistance was an impossibility and that out-patient treatment could only be effective if some scheme to enable the wage-earner to rest while undergoing treatment could be introduced; for only Government servants of 5 years standing and employees of a few large firms could get adequate leave with pay. The current rates of public assistance were quite inadequate and represented only a token of the actual subsistence rate at that time. Slight augmentation of these rates was obtained in certain cases from other charitable sources. In 1948 a scheme was prepared by the Government Medical Department along the lines of the war time T. 266 scheme in the United Kingdom and arrangements for its administration were made with the Social Welfare Department of the Government of Singapore. This provided for a high rate of assistance if the prognosis of the case was favourable. Invidious though such a scheme may be in having to refuse assistance to those most advanced and incapacitated it seemed likely, however, to yield a greater dividend in restored health to the community by returning men to productive work who would otherwise become a further source of infection and danger to the community. With limited financial resources it was necessary to make this choice and the scheme was drawn up to enable the whole family of the infected person to obtain that standard of nourishment which would enable him to undergo a satisfactory course of domiciliary treatment and thus enable him to return to work at the earliest time compatible with the progress of his case.

This scheme was put into effect in April 1949, and coincided with the opening of the new up-to-date Tuberculosis Clinic which had been presented to the Tan Tock Seng Hospital by the Rotary Club of Singapore. At the same time the services of a trained almoner were obtained. She has played a most important part both in the inception of the scheme and its later development.

During 1950 the Singapore Anti-Tuberculosis Association opened a treatment centre for out-patient treatment of tuberculosis and some of their cases also became eligible for allowances under this scheme.

The Tuberculosis Treatment Allowance Scheme is operated by the Department of Social Welfare with the assistance of the Advisory Committee, T.B. Treatment Allowances, which was formed in March 1949, and now includes all members of the Silver Jubilee Fund Committee of Management, the Government Tuberculosis Specialist and the senior Almoner at Tan Tock Seng Hospital, together with a representative from the staff of the Royal Singapore Tuberculosis Clinic managed by the Singapore Anti-Tuberculosis Association.

The payment under the T.B. Treatment Allowance Scheme of allowances at scales well above subsistence levels is restricted to patients whose prognosis is good and who are likely to be returned to their former working capacity within a reasonable space of time. Persons unlikely to be able to return to work are catered for by the Public Assistance Scheme. The recommendation of cases for assistance is undertaken by the medical authorities of all Government hospitals especially the Tan Tock Seng Hospital, the Royal Singapore Tuberculosis Clinic, the Royal Naval Asian Hospital and the St. Andrew's Mission Hospital. The continued payment of allowances which are calculated to assure a reasonable diet for the patient and his or her family is dependent upon the patient refraining from work and the receipt by the Department of Social Welfare of a satisfactory monthly progress report from the medical officer in charge of the case. Non-co-operation in the matter of treatment results in the immediate withdrawal of a patient's allowance.

The allowances under the Scheme current in 1952 were:—

		$
Head of household as	(i) out-patient ...	45 per month
	(ii) in-patient ...	15 per month
Wife (and from July 1952 the first adult dependent relative)		25 per month
Each dependant aged 16 years and over ...		15 per month
Each dependant under the age of 16 years ...		12 per month

* ($5 per month in the case of a patient with no dependants).

In addition, a 10 per cent cost of living allowance was payable on the above amounts together with an additional allowance equal to the actual rent paid by the family.

In cases where a wife, especially one with young children, has contracted tuberculosis and the income of her husband is insufficient to ensure an adequately nutritious diet for the family, she may also be considered for an allowance in her own right under the T.B. Treatment Allowance Scheme. In such circumstances the

allowance is calculated as for a head of household to which is added the actual rent paid by the family, the school fees and an allowance for domestic help, and a deduction made equal to the income of the family from all sources (which in practically every instance means only the husband's wages). The standard allowance for domestic help (intended to cover the payment of part-time assistance for the heavier domestic duties) is $35 per month but it is reduced if there are children over the age of 12 years not attending school and not in employment, and is disallowed altogether should there be a dependent relative over the age of 21 years who is not engaged in outside employment and is fit enough to assist in the performance of domestic duties.

The table below shows the growth of the scheme from April 1949 to the end of 1952:—

———	1949	1950	1951	1952
Average monthly number of Patients	160	306	477	983
Average Payment	$69.77	$62.34	$70.67	$75.47
Total number of Payments ..	1,440	3,665	5,734	11,805
Total Cost of Allowance Scheme	$100,468.37	$228,491.87	$405,349.87	$890,887.35

In September 1951 the Committee administering the fund asked the Department of Social Medicine and Public Health of the Faculty of Medicine of the University of Malaya to conduct a survey to assess the value of this scheme in the control of tuberculosis and what measures of success it had achieved and whether requests for further sums were justified. This request was approved and this note includes extracts from the report made by Dr. Mary Grove-White, Assistant Lecturer in Social Medicine and Public Health, prepared in collaboration with the staff of Tan Tock Seng Hospital and the Social Welfare Department.

Although this report could not be prepared before the end of 1951 Government approved a further increase of money for 1952 and the report was tabled and accepted by the Treatment Allowance Committee in time to support yet a further increase up to $1,000,000 for the Estimates for 1953.

In doing the survey, it was accepted from the start that no controlled experiment could be done, but it was decided to follow up the first 500 cases put on this scheme and to see what measure of success had been achieved in the treatment of the cases and what degree of stability had been maintained following their return to work.

A proportion of the cases in this early series was minimal or early sputum negative cases and if a further survey proves possible at a future date, this will be one of the main contrasts. Since the end of 1950 a far greater emphasis has been placed upon the bacteriological aspect and increasing use of this scheme and our treatment facilities has been made to close 'open cases'.

The period of the survey more or less coincided with the arrival in the colony of Streptomycin and P.A.S. but these were only in short supply, and were used with caution and reserved largely for cases of miliary tuberculosis, meningitis, recent exudative disease and tuberculous laryngitis. In later cases treatment in this series shows there has been a more extensive use of antibiotics as the supply position improved and the knowledge that incidence of Streptomycin resistance could be reduced by combining it with P.A.S.

Of the first 509 cases who received treatment allowances nine were subsequently found to be non-tuberculous and their allowances were stopped for that reason.

Of the remaining 500 after the period of financial assistance they were assessed as follows:—

Good progress and improved	...	366 (73.2 per cent)
No change	...	66 (13.2 per cent)

They were certified as fit for work.

Deterioration = 48 cases (9.6 per cent). These were transferred to the general relief section because of unsatisfactory medical progress.

Died during period of allowances = 5 (1 per cent).

In 11 cases (2.2 per cent) the records have been lost and it is not possible to assess the progress made. Four cases were still in receipt of allowance—due to relapse—and were not assessed.

Condition 2–3 years after the first receipt of financial assistance was next assessed.

302 (60.4 per cent) patients were found to be stable. Of these 160 are still having active collapse treatment. (Pneumothorax or pneumoperitoneum). 77 (15.4 per cent) could not be traced. Of these 31 (6.26 per cent) have returned to China, India and Indonesia. Of the remaining cases 10 are in institutions (Mental Hospital or Trafalgar Home) or have been referred to treatment centres in the Federation. 72 (14.4 per cent) have deteriorated. In 35 cases this was due to failure to attend the clinic. 35 (7 per cent) have died. This figure includes the 5 who died while receiving assistance.

It is interesting to follow the 48 patients who had their allowances stopped because of poor progress. 7 of these are now stable (5 of them are receiving collapse therapy), 4 have returned to their native lands, 2 could not be traced, 15 have deteriorated further and 20 have died.

HOSPITALIZATION

Only 271 (58.2 per cent) of patients were in hospitals for periods of 2 weeks or longer. Of these 194 (38.8 per cent) were aged 15–34 years: 96 (19.2 per cent) were aged 35–54. Only one patient of 55 and over was admitted to hospital.

RETURN TO WORK

321 (64.2 per cent) of all patients returned to work. 166 of these returned within one month of cessation of allowance, 65 within three months, 25 within six months, 65 more than six months, after assistance had been stopped. 50 (10 per cent) never returned to work. 4 cases were still receiving allowance. 31 of the 35 patients who died never returned to work. 10 patients are in other institutions. In 84 (16.8 per cent) cases it was not known whether they returned to work.

Age Groups of Patients returned to work

	Total cases	*Returned to work*	*No return*
15–24	124	77 (62.1 per cent)	17 (13.7 per cent)
25–34	190	100 (52.6 „)	24 (12.6 „)
35–54	181	123 (68.0 „)	7 (0.4 „)
55 + ...	6	1 (16.6 „)	2 (33.3 „)

RE-EMPLOYMENT BY SAME EMPLOYERS

Of the 321 patients who returned to work 127 had their jobs held open for them. In some instances they did a lighter type of work for the same firm. In 142 cases the job was not kept open. 50 cases were self-employed such as hawkers, tailors, shopkeepers, or were married women with children. One patient was a student who had not a job previously. One was not allowed to return to his old work as an ice-cream seller.

An investigation was also carried out on the types of employment to which patients returned and the relapse rate examined in the various types of work which for this purpose were classified into heavy, medium heavy, medium light and light. There was no significant increase in the relapse rates in the heavier work groups but as the physical condition and general health had to be very good before permission was given to a patient to undertake heavy work, this is not very surprising. Further examination was made on the number of dependants in the families assisted by the scheme to see whether there was any significant increase in relapse rate where the number of dependants was large. In this case also no trend of statistical significance was discovered.

The table below shows the period on allowances. It will be seen that of the 500 cases, 461 were assisted by the Scheme for less than one year, and only 19 for over $1\frac{1}{2}$ years.

PERIOD ON ALLOWANCES

Age	Months 0–6	Months 7–12	Months 13–18	Months 19 and over	Total
15—24	70	44	5	5	124
25—34	99	76	9	6	190
35—54	100	66	6	8	180
55 and over	6	..	..	..	6
Total Cases ..	275	186	20	19	500

DISCUSSION

During the follow up and survey of the first 500 cases the opportunity has been taken to examine the clinical effects, and an attempt to evaluate the relative advantages of the different types of treatment. This has not produced any very striking information, but it has demonstrated that there is a considerable group of patients who could not be stabilized without the assistance of major surgery. Most of the failures of the unilateral disease could have been controlled by modern surgical methods. In the cases of bilateral disease it was often possible to arrest the less heavily involved side, but here again, closure of cavities in the more seriously involved lung could not be undertaken.

The follow up also brought to light a number of cases who, after a period of satisfactory progress as out-patients, had ceased to attend because of the difficulty of coming for refills or the fear that their employers might discover that they were suffering or had suffered from tuberculosis. Some of these remained stable; others were caught actually at the time of relapse. Sputum conversion was obtained in 208 out of 294 cases with positive sputum. Of the 80 cases whose sputum remained positive despite treatment, 30 had been treated with Streptomycin and though 5 died, the remainder may be Streptomycin resistant. It must be pointed out that these records relate to a period before combined antibiotic therapy was generally applied.

It will be seen that there has been a steady increase in the number of cases put on the scheme and in the money spent upon it. It is desirable and it is hoped it will prove practical to analyze a later sample and see how it is working in comparison with the early group. In these earlier cases 87 out of 500 were given antibiotic therapy. In later groups the proportion has been considerably higher. In these series antibiotics were given to in-patients only but in March 1951 a scheme for Streptomycin and P.A.S. was started for out-patients using a regimen similar to that advocated by the Veterans Administration at the 9th Streptomycin Conference of giving bi-weekly injections of Streptomycin and daily P.A.S. by mouth. In all some 300 out-patients have had courses of treatment each year in addition to those in-patients who had had antibiotic therapy. In the case of our out-patients antibiotics scheme the patient must come to the hospital for injections, as our staff does not allow antibiotic therapy in the home. The availability for antibiotics for patients in which the prognosis would have been hopeless without their use has brought many more cases within the scope of the Treatment Allowance Scheme and this has been partly responsible for the increase in the number of cases on the scheme. It was interesting to note that on our first 300 cases on out-patient antibiotics, 10 per cent only developed resistance to Streptomycin. Later groups will include a certain proportion of cases treated at the Singapore Anti-Tuberculosis Association treatment centre where various different regimens of antibiotic therapy have been in use since its opening in 1950. Standards of certification between the various authorities recommending cases for the scheme has not yet been finally achieved. Minor individual differences will, of course, always exist.

Another factor which has influenced the later development of the scheme has been the gradual increase in the availability of surgical treatment. In the earlier series there is no doubt that the proportion of arrested cases would have been higher had surgery been readily available and had patients been willing to undergo it. In 1949 only 6 and in 1950 only 14 thoracoplasties were performed. In 1951 the figure had risen to over 30, and although there was a drop in 1952 due to the absence on leave of the surgeon who had done most of these operations, the figure will be higher again this year. Pulmonary resection in suitable cases has been successfully carried out on a number of cases already and its more extensive use will lead to sputum conversion in a type of case which had previously

defied more conservative methods of treatment. The total number of cases of active pulmonary tuberculosis under treatment in regular attendance at Tan Tock Seng Hospital Out-patients Department has risen from 1,000 in 1947, 2,400 (1949) to 3,600 (1952). (The 1953 figure will approach the 5,000 mark).

Alongside this increase in out-patients there has been a gradual increase in the in-patient accommodation which has developed from some 200 beds in 1947 to 500 in 1952 and the Singapore Government Medical Plan envisages a further increase to 1,100 beds for tuberculosis which will include a Thoracic Surgical Unit. Since the war some 14,500 cases of suspected or confirmed tuberculosis have passed through the in-patient and out-patient divisions of the Singapore Government Tuberculosis service.

VOLUNTARY ORGANISATIONS ASSISTING IN TUBERCULOSIS WORK

The work of the Singapore Anti-Tuberculosis Association has been mentioned in the opening paragraphs of this chapter and the new Singapore Tuberculosis Home Association and its proposed home for chronic tuberculosis destitutes has been noted. In addition the following voluntary organisations assisted in the care and treatment of patients in or from the Tan Tock Seng Hospital:—

The Hospital Diversional Therapy Unit continued its excellent work in providing diversional therapy for the patients. During the year a full time Diversional Therapist was employed by Government and worked with the unit and introduced many useful new ideas. Co-operation between this officer and the voluntary organisation has been most harmonious and beneficial to the patients of the hospital. This unit's work is most valuable and we are greatly indebted to these ladies for their untiring efforts.

The Red Cross Society continued its library service on two days a week and this is greatly appreciated by the patients who look forward eagerly to the bi-weekly rounds.

The female patients convalescing from tuberculosis, or wives of tuberculosis sufferers on the treatment allowance scheme who required assistance, were referred to the Family Planning Association Clinic for advice where indicated on medical grounds, at the particular instance of the Tuberculosis Treatment Allowance Committee.

TUBERCULOSIS NURSING CERTIFICATE

In the Mandalay Road division of the Hospital, student nurses are recruited to the Nursing Service under the tuition of the Franciscan Sisters who train them for the Tuberculosis Nursing Certificate. They complete their tuberculosis training in two years, the first year being the same as the first year general training for State registration. Three nurses were successful in their examinations in June and one in December; two Sisters were also successful and one Hospital Assistant from Tan Tock Seng hospital also passed.

ASSISTANT NURSES TRAINING SCHEME

During 1952 further recruitment was made to the Assistant Nurses training scheme. These girls who have passed Standard V at school, work in the Tuberculosis Wards in the main division of the Hospital. Their training concentrates more on the practical than the theoretical aspects of nursing and the scheme is making progress.

GOVERNMENT TUBERCULOSIS ADVISORY BOARD

The Government Tuberculosis Advisory Board met on two occasions during the year. A recommendation was made to the Singapore Improvement Trust to adopt a scheme for a new form of certificate to be issued to those applying for S.I.T. flats only from the Royal Tuberculosis Clinic and the Government Hospitals. This certificate is now in use.

Professor Heaf was present at the meeting in September and gave the Board the benefit of his advice on a number of important questions. In particular he discussed the B.C.G. programme and recommended that a concentration of effort be directed against particularly susceptible groups, such as medical students and nurses and those dealing with tuberculosis and tuberculous contacts. School-leavers should be the next group and when these groups had been covered, he advised working down the age groups. He also recommended that in the meantime the infantile B.C.G. vaccination should be discontinued in order to concentrate effort on more susceptible groups.

THE B.C.G. CAMPAIGN

The programme of testing for tuberculin sensitivity, and inoculation with B.C.G. of the new born and negative reactors, initiated by the U.N.I.C.E.F./ W.H.O. team for a period of 4 months from June 1951, was continued by the Government of the Colony through that and the current year. During this period 81,111 persons were tested and 31,922 were found to be negative reactors. A total of 33,126 B.C.G. inoculations, which includes 1,607 in the new born, were given.

It was reported in the previous year's Annual Report that in recording as positive the reaction following Mantoux testing with 5 T.U., an induration with a diameter of more than 3 m.m. was the standard adopted. This should have read 'only indurations exceeding 4 m.m. were marked as positive.'

In August 1952, Professor Heaf, the tuberculosis expert and consultant to the Colonial Office, visited Singapore and advised that in Mantoux testing a more accurate measurement could be obtained by using 10 T.U., his main reason being that what matters is a concentration of the substance rather than its volume. His recommendation was adopted and from 26th August, 1952, 10 T.U. has been used in all Mantoux testing. Further, he recommended that the inoculation of the new born with B.C.G. should not be practised at this stage and that testing and immunizing programmes should commence from the 20 year age group downwards and not from infancy upwards. This procedure was adopted accordingly.

It has been possible to analyse all persons observed during the year 1951, but since the information recorded on the cards is not sufficient it has not been possible to break down these figures into social classes, occupational groups, etc. The findings available for this period are shown on the following pages. The 1952 figures are still under analysis.

It will be noticed that by the age of 30 years nearly all individuals are Mantoux positive and that the graph ascends fairly rapidly to this state. Recent investigations lend support to the view that reactions to tuberculin sensitivity tests are not absolutely specific and that there is a varying fraction which is produced by non-specific allergy. In consequence the argument, adduced by McDougal (Global studies in the Social Pathology of Tuberculosis) that where sensitivity response is as high as that revealed by this graph the mortality rate arising from tuberculosis must exceed 1,600 per million, should be qualified by this possible non-specific response factor. The tuberculosis mortality rate from all forms in 1951 was 1,415 per million, a reasonably close approximation to the figure McDougal lays down as a necessary accompaniment of such high sensitivity rates. If allowance is made for the influence of other circumstances on allergic response, then the rate of 1,415 per million in 1951 would appear to suggest that deaths *recorded* as due to tuberculosis cannot differ materially from deaths *actually due* to the disease.

It would appear that the incidence of tuberculosis in Singapore is higher than that recorded in some Western countries. But what is not certain is whether it is sufficiently well understood that the chief factor in the maintenance of this high prevalence rate is not so much a lack of medical facilities for isolation and treatment as the abundance of such factors as intense overcrowding in insanitary buildings, the comparative lack of sanitary discipline in the people, the lower standard of living judged by conditions in the West, and the general failure to realise that tuberculosis is a highly infectious disease.

A point that is apt to be forgotten is that when we attempt international statistical comparisons we select as standards highly developed and progressive countries like the United Kingdom, and neglect comparisons with our neighbours in Asia. In the East our rates should compare more than favourably with the best in Asia, but unfortunately accurate data are not available. While tuberculosis can be conquered, its control by purely medical measures cannot show outstanding success until there is considerable improvement in our general housing conditions and in the sanitary consciousness of our citizens.

TUBERCULIN—POSITIVE RATES

State—Singapore Year 1951

Age	MALE						FEMALE					
	MORO			MX. 5 T.U.			MORO			MX. 5 T.U.		
	Compl. Test	+ ve	Per cent	Compl. Test	+ ve	Per cent	Compl. Test	+ ve	Per cent	Compl. Test	+ ve	Per cent
0	323	8	2.5	122	3	2.5	352	8	2.3	109	5	4.5
1	105	4	3.8	85	3	3.5	119	9	7.6	50	4	8.0
2	145	14	9.7	98	4	4.1	158	22	13.9	83	7	8.4
3	166	25	15.1	116	16	13.8	190	27	14.2	88	9	10.1
4	216	58	26.9	139	23	16.5	224	44	19.6	80	8	10.0
5	245	73	29.8	164	46	28.0	269	69	25.7	81	32	39.5
6	481	214	44.5	182	79	43.4	479	192	40.1	115	59	51.3
7	1,278	532	41.6	407	200	49.1	1,082	492	45.5	204	107	54.5
8 .. 54.9	1,369	613	44.8	351	199	56.7	1,230	600	48.8	212	112	52.8
9 .. 57.0	1,459	739	50.7	285	162	56.8	1,355	688	50.8	164	94	57.3
10 .. 66.2	1,081	989	54.9	263	173	65.8	1,575	916	58.2	195	130	66.1
11 .. 71.7	1,777	1,022	57.5	464	328	70.7	1,458	868	59.5	402	293	72.9
12	129	61	..	2,067	1,461	70.7	131	72	..	1,572	1,049	66.7
13	28	8	..	1,792	1,320	73.6	31	9	..	1,308	890	68.0
14	12	0	..	1,479	1,109	75.0	12	3	..	1,096	783	71.4
15	14	0	..	1,199	907	75.6	3	0	..	878	638	72.7
16	3	0	..	830	650	78.3	2	0	..	624	445	71.3
17	1	0	..	525	391	74.5	1	1	..	442	332	75.1
18	..	..	..	305	231	75.7	..	..	..	354	284	80.2
19	..	..	..	181	145	80.1	..	..	..	231	185	80.1
20–24	1	1	..	283	239	84.5	1	0	..	738	604	81.8
25–29	..	..	..	152	138	90.8	1	1	..	591	530	89.7
30–34	1	1	..	126	120	95.2	..	..	..	452	414	91.6
35–39	..	..	..	116	114	98.3	..	..	..	326	308	94.5
40–44	..	..	..	101	101	..	..	..	..	172	164	..
45–49	..	..	..	74	72	..	..	..	..	79	76	..
50–54	..	..	..	47	47	..	..	..	..	55	53	..
55–59	..	..	..	10	10	..	..	..	..	22	19	..
60–64	..	..	..	3	2	..	..	..	..	10	9	..
65	..	..	..	1	1	..	..	..	..	3	3	..
Unknown ..	32	13	..	50	48	..	12	5	..	40	31	..
Total ..	9,586	4,375	..	12,017	8,342	..	8,685	4,026	..	10,776	7,677	..

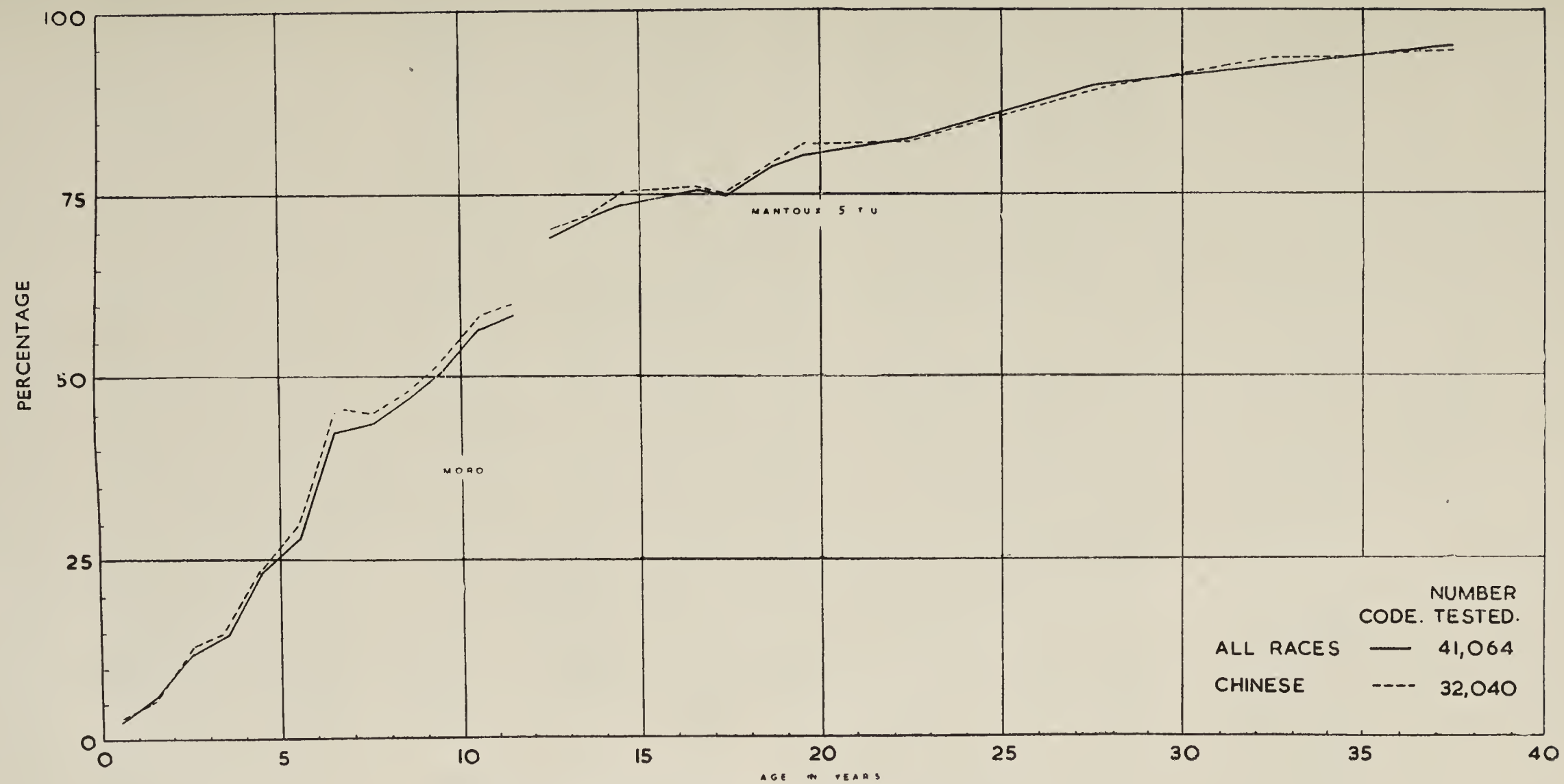
Remarks:—Total completing Test .. .. 41,064 Blank Cards 126

Total Negative Reactors .. .. 16,644 Questionable Cards 41

Total B.C.G. Vaccinated 16,510

These figures do not include 1,294 new borns who were vaccinated without having been first given atuberculin test.

PERCENTAGES OF POSITIVE REACTORS TO TUBERCULIN TESTS BY AGE IN SINGAPORE 1951.



Department of Social Medicine and Public Health, University of Malaya

CHAPTER NINETEEN

VENEREAL DISEASE

THE STEADY progress maintained in the various activities of this division resulted in a further reduction in the incidence of new infections during 1952. Some of the notable improvements in different sections during the year are briefly reviewed hereunder:—

SEROLOGICAL LABORATORY

An excellent laboratory for this purpose was established in 1951 in the 'dock area' clinic when most of the structural alterations to the building were completed. It is now in charge of a specially trained technician who has been responsible for carrying out over 3,000 quantitative Kahn Tests in addition to the routine work of tests with cardiolipin. The laboratory was visited and approved by the Serologist of the South-East Asia Region, World Health Organization, and the antigens employed have been the same as those used by W. H. O. workers in the field. Some of the advantages of this additional facility have been:—

(*a*) prompt diagnosis in 24 hours for seamen whose sojourn in the port is necessarily of short duration;

(*b*) scientific control of treated syphilitic cases on follow-up, as the titre of these tests clearly indicates the advisability or otherwise of further courses of treatment;

(*c*) counter check of one test against another—a great safeguard for the patient.

EPIDEMIOLOGICAL CONTROL

The activities of this section are mainly directed towards:—

(*a*) follow-up of treated cases to detect relapse or re-infection;

(*b*) to contact defaulters;

(*c*) family screening of a married patient;

(*d*) voluntary antibiotic prophylaxis of prostitutes.

This work as organized here is thought to be ideal for Asian countries, and a practical compliment was paid by W. H. O. during the year when it attached a Social Worker from Philadelphia U.S.A. for ten days to study this set-up with a view to its introduction in other countries of South-East Asia.

The staff consists of a Senior Supervisor and nine lady assistants who were responsible in 1952 for 8,921 home visits with a 'success rate' of 60 per cent—a great improvement over 1951 when it was only 35.5 per cent. New homes were also visited for propaganda purposes and these totalled

2,673 (928 in 1951). Altogether there are now 1,053 known families on the register which have been screened after one or the other member of the family was found to be suffering from a venereal infection: 344 of these were new cases.

The antibiotic prophylaxis for prostitutes also appears to have met a great need in the community. This service which is on an entirely voluntary basis was instituted towards the end of 1950 when there were only 117 women on the register kept for this purpose. The total number at the end of 1952 was 416 out of which 168 had ceased to attend, the chief reasons being marriage, or rehabilitation, and engagement in other gainful employment. During the year 192 new prostitutes sought such treatment. While in 1950 and 1951 most of these women were referred to this department by the Services or Civilian police, in 1952, 92 reported of their own accord, 24 were referred by the Services and 76 by Civilian anti-vice squads. This is a welcome development. What is more, many more such promiscuous women are attending the clinics of private practitioners in town for prophylaxis. 7,659 prophylactic treatments were administered during the year.

Another function of this section is to keep close liaison with the Social Welfare Department of the Colony. This Department referred seventy-six young girls below the age of eighteen during the year, out of whom only nine were found infected. These girls are referred after treatment to the rehabilitation homes and kept under constant surveillance. This drop in the number of cases of 'minor' girls needing attention is thought to be one welcome indication of a lessening of prostitution and improvement of social circumstances of certain sections of the population of Singapore.

Another distinctive feature of the Singapore V.D. organization is the propaganda which is carried out by the epidemiological section. The personnel visits the homes of under-privileged people and tactfully induces them to report for a blood test. Little reliance can be placed on posters or films in dealing with the poor illiterate class which seek treatment in the main at the Government institution. Individual propaganda is carried to that segment of population which through ignorance and lack of means is more susceptible to these diseases and more liable to neglect examination or treatment, or become the subject to exploitation by quacks.

TRAVELLING DISPENSARY

Although this service was only inaugurated in November 1950, its facilities seem to be growing in popular demand and are being fully utilized by the public, specially by women at ante-natal centres in rural areas. The number of new cases investigated has increased from 2,375 in 1951 to 2,753 in 1952. Similarly the number of old cases discharged from the Social Hygiene Hospital and treated by this service has increased from 789 in 1951 to 991 in 1952 and the number of antenatal cases examined has reached the figure of 1,784.

During the last two years 3,147 pregnant women have been examined of whom 141 or 4.5 per cent were found to be syphilitic. The positive rate in primiparæ, is about one-third of multiparæ. The following two tables summarize the work during the year:—

NUMBER OF LOCALITIES VISITED AND NEW CASES EXAMINED IN 1952

Clinic	NEW CASES		No. of ante-natals	V.D. cases	Investi-gation cases	Total
	Male	Female				
Central Rural						
Yio Chu Kang						
Upper Serangoon ..	136	654	560	43	747	790
Seletar						
Paya Lebar						
Rural West						
Bukit Timah						
Pasir Panjang						
Lim Chu Kang	355	878	777	71	1,172	1,233
Lam San Village						
Bukit Panjang						
Rural East						
Changi						
Ulu Bedok	91	571	447	44	618	662
Kampong Batak						
Homes and Schools						
Bukit Timah Boys Home ..	68	..	..	2	66	68
Total ..	650	2,103	1,784	150	2,603	2,753

Number of old cases discharged from the Social Hygiene Hospital and treated in various centres during 1952:—

Clinics	*Syphilis*	*G.C.*	*Total*
CENTRAL RURAL			
Yio Chu Kang, Upper Serangoon	88	5	93
Seletar	207	27	234
RURAL WEST			
Bukit Timah	293	37	330
RURAL EAST			
Changi, Ulu Bedok, Kampong Batak	298	36	334
Total ...	886	105	991

DERMATOLOGICAL CLINIC

This clinic had its modest beginnings in 1951, when it confined its activities once a week to diagnosis of skin ailments of V.D. cases and referred them for treatment to the General Hospital. As many non-venereal cases began to report to this institution with similar complaints, the number of sessions was increased to three per week and in addition to diagnosis treatment was administered as well. Due to lack of accommodation only selected cases were admitted for indoor treatment.

This additional service helped further in training people to apply for a routine blood test and in finding unsuspected V.D. cases for treatment. Thus it contributed towards the control of such diseases in Singapore. The clinic was responsible for the treatment of 2,266 skin patients in 1952. One hospital assistant had special training for three months at the General Hospital for this purpose.

EDUCATIONAL CONTRIBUTION

As is evident from this short resumé the educational value of the institution has naturally increased. The students of the Faculty of Medicine of the University of Malaya, in addition to learning the various techniques in the diagnosis and treatment of venereal diseases have the opportunity to familiarize themselves with modern serological procedures and their significance in various stages of syphilis and to assess the assistance these render in diagnosis and further treatment.

They gain an insight into the dermatological problems of the poor and see for themselves the actual results of epidemiological control.

Various experts from W.H.O. (South-East Asia and West Pacific Regions) visited the hospital and clinics during the year in addition to another group of Indonesian doctors and nurses who were on a W.H.O. Public Health Study tour.

One scientific contribution made during the year has been the publication of a report on 'Charcot Joints—a report on two cases in Singapore—'. This included a case of double Charcot Joints of the hip—a rare phenomenon—reported for the first time in Malaya.

ATTENDANCES

The continuous decline in incidence of venereal diseases has not yet been reflected in either the number of new patients seeking treatment or total annual attendances. Limiting factors in this connection appear to be lack of accommodation and staff. The present facilities have been fully extended and should only cater for about 120,000 attendances per annum. If more skin or non-specific urethritis cases continue to report next year, even this figure is bound to be affected as most of such cases require individual attention and a longer time for each treatment administered. The increased demands of antenatal women in rural areas are already fully stretching the special staff of the female section of the travelling dispensary service set aside for this purpose.

The following table shows the number of new in-patients, out-patients, and total attendances during the last five years:—

Year	*In-patients*	*Out-patients*	*Total Attendances*
1948 ...	2,478	12,986 (3,047 females)	72,913
1949 ...	2,221	14,478 (3,721 females)	96,258
1950 ...	2,555	15,249 (3,884 females)	105,592
1951 ...	2,633	15,958 (4,794 females)	124,830
1952 ...	2,434	16,002 (4,873 females)	125,150

As pointed out in last year's report, in-patients are mostly old and chronic sufferers from tertiary and latent syphilis or of non-specific discharges. During 1952 skin cases also occupied a number of beds and many of them remained for a month or so in hospital. These proved to be the limiting factors in the turnover of the patients. Hence fewer admissions to the hospital are recorded. It was not considered expedient to discourage this natural development as it was felt that these cases could not be restored to normal health till completely cured of their infections.

INCIDENCE OF VENEREAL DISEASE

The following table summarizes the number of V.D. infections reported during the last four years:—

Year	*Syphilis infections*	*Other V.D. infections*	*Total*
1949	4,575	5,885	10,460
1950	3,137	5,656	8,793
1951	2,512	5,275	7,787
1952	2,097	4,243	6,340

Although the population has increased during the last four years there has been an all round reduction in the reported cases of V.D. by over 40 per cent since 1949. Reported cases of early syphilis (primary and secondary) and of gonorrhœa have been as follows:—

	Primary Syphilis	*Secondary Syphilis*	*Gonorrhœa*	*Gonorrhœa Complications*	*Total*
1951 ...	485	460	2,816	139	3,900
1952 ...	322	223	2,690	115	3,350

TERTIARY AND LATENT SYPHILIS

This important category of patients seems to report in increasing numbers every year due to better case finding methods. These people are an unfortunate legacy of olden days and are either the incompletely treated or those who never sought treatment at all as no contact service existed then. In course of time these complications should diminish to a vanishing point.

The following two tables give the breakdown by type of disease, race and sex in 1952:—

Race	Gum-mata and Skin	Bones and Joints	Cardio-vascular	G.P.I.	Tabes	Other Neuro-syphilis	Total
Males							
Chinese	39	86	26	22	27	48	248
Indian	14	39	3	5	1	11	73
Malayasian ..	2	12	1	1	4	5	25
Others	1	8	1	..	..	3	13
Females							
Chinese ..	7	2	7	..	2	16	34
Indian	..	1	1	..	..	3	5
Malaysian ..	3	2	1	..	..	6	12
Total ..	66	150	40	28	34	92	410

The ratio of various lesions has been:—

	1950	*1951*	*1952*	
	Per cent	*Per cent*	*Per cent*	
Neuro-syphilis	35.6	37.3	37.5	
Cardio-vascular	10.8	7.2	9.8	
Cutaneous	29.7	19.7	16.1	Benign.
Bones and Joints	23.9	35.8	36.6	Benign.

Benign lesions constituted 52.7 per cent and neuro and cardio-vascular 47.3 per cent. The ratio seems to be more or less the same over the last three years.

Race	MALE			FEMALE		
	EARLY Latent	LATE Latent	Total	EARLY Latent	LATE Latent	Total
Chinese	135	237	372	82	155	237
Indian	63	144	207	16	33	49
Malaysian	18	27	45	43	60	103
Eurasian	1	3	4	1	2	3
European	1	4	5	..	..	..
Others	2	6	8	3	5	8
Total ..	220	421	641	145	255	400

365 or over 36 per cent of such cases were of early latent syphilis.

CONGENITAL SYPHILIS

This manifestation of syphilis in older age-groups is bound to remain with us for some time to come as it belongs to the same category as latent and tertiary syphilis of the acquired variety. Its incidence in young infants below the age of one year is decidedly on the decrease.

No. of congenital cases in babies:—

1950	...	...	117
1951	...	...	70
1952	...	...	59

This 50 per cent reduction in the course of three years is remarkably good as from a Public Health point of view such a condition is entirely preventable. All that is required is a blood test on every pregnant woman attended to by a medical practitioner with reference of positive cases to this hospital for treatment if the patient is unable to afford private medical expense.

GONORRHŒA

It is difficult to say if gonorrhœa is really on the decrease as its treatment has become so simple that most of the cases now seek the private practitioner. It is true however that both in the armed forces and in the clinics of this division the number seems to have been gradually diminishing over the past four years:—

	Gonorrhœa	*Gonorrhœa Opthalmia*	*Gonorrhœa Complications*	*Total*
1949	3,207	133	238	3,578
1950	3,209	86	192	3,478
1951	2,816	49	90	2,955
1952	2,690	60	55	2,805

In the male the number of relapses, multiple attacks and association with non-specific urethritis appears to be more or less stationary:—

	No. of Male Gon. cases	*Gon. and Non-Sp. urethritis*	*Per cent*	*Relapses*	*Per cent*
1951 ...	2,533	183	7	142	5.6
1952 ...	2,505	220	8.8	158	6.3

About 20 per cent of the males had more than one attack.

NON-SPECIFIC URETHRITIS

More patients seem to seek advice and treatment for this difficult condition year by year:—

	No. of Non-Specific urethritis
1950	30
1951	192
1952	217

As there have been 220 cases associated with gonorrhœa, the total for the year was 437 against 375 in 1951. This total is without doubt an under estimate, as in the armed forces in Singapore 50 per cent of cases of urethral discharge have been of a non-specific nature. As the signs and symptoms of this malady are generally mild, only educated people report for treatment in the clinics. Intense research work on the condition is being carried on in the laboratories of different countries, particularly in the U.S.A., and it is hoped that both the cause of the condition and its cure will soon be elicited. At present the pre-penicillin era treatment of urethral discharge still seems to give the best results in resistant cases.

LYMPHOGRANULOMA INGUINALE

The incidence of this disease during the last three years does not show much variation:—

	No. of cases
1949	143
1950	223
1951	233
1952	194

In Singapore at present it is a comparatively mild condition very amenable to treatment. In consequence it seldom presents the classical picture of an indolent bubo with multiple discharging sinuses.

SOFT SORE

There has been a steep fall in the incidence of this affection in 1952:—

	No. of cases
1949	1,796
1950	1,494
1951	1,600
1952	943

Perhaps training of prostitutes in cleanliness at the prophylactic clinic is responsible for this result.

MIXED INFECTIONS

These too show a definite downward trend in 1952:—

	No. of cases
1949	368
1950	472
1951	487
1952	301

The following table gives the breakdown by race:—

MIXED INFECTIONS

Race	Gono with Syph. I	Gono with Syph. II	Gono with E. Latent	Gono with L. Latent	Chancroid with Syph. III	Chancroid with E.L.	Chancroid with L.L.	L.I. with E.L.	L.I. with L.L.	Chancroid with Gon.	Chancroid with Syph.	Total
Chinese	12	18	66	54	2	15	8	7	8	4	2	196
Indian	1	1	34	26	1	3	6	3	3	1	..	79
Malaysian	..	..	14	5	2	1	..	1	..	..	..	23
Eurasian	..	..	1	..	..	..	..	..	..	..	..	1
European	..	..	1	..	..	..	..	..	..	..	..	1
Others	..	..	..	..	1	..	..	..	..	..	..	1
Total ..	13	19	116	85	6	19	14	11	11	5	2	301

INVESTIGATION CASES

How closely the work in the Social Hygiene centre in Singapore follows the trend in venereal clinics in England and Wales is shown by the number of investigation or non-V.D. cases treated in both places. In 1950 in England and Wales 71 per cent of the patients treated were non-V.D. In Singapore in 1952, 9,662 out of 16,002 or 60 per cent were of a similar nature, as shown in the following table:—

	1950	*1951*	*1952*
Apprehensive group including antenatal and contact cases	2,802	4,711	5,301
Dermatological complaints	1,720	1,652	2,266
Arthritis and arthralgia	713	451	445
Non-gonococcal urethritis, cervicitis, trichonomas infestation, dysuria, hæmaturia, etc. ...	654	604	846
Other genital infections, balanitis, warts, paraphimosis, traumatic ulcers, hydroceles, non-specific epididymitis, and sexual complaints	344	290	286
Yaws	56	118	138
Leprosy	18	15	31
Non-venereal—Iritis, conjunctivities, etc. ...	39	45	27
Miscellaneous	110	285	322
Total ...	6,456	8,171	9,662

SEAMEN

The number of new seamen patients shows little fluctuation during the last four years:—

	No. of patients
1949	862
1950	939
1951	831
1952	864

The following table gives details by race:—

SEAMEN

Race	Primary	Secondary	Tertiary	Period not indicated	Gonorrhœa	Gonorrhœal complications	Soft sore	Lymphogranuloma	Mixed Infections	V.D. Cases	Investigation Cases	Total
Chinese	13	17	14	22	62	4	19	5	9	165	126	291
Indian	1	..	..	2	6	..	4	..	1	14	16	30
Malaysian	7	6	2	8	38	..	6	3	2	72	24	96
Eurasian	..	..	..	..	1	..	..	..	1	2	2	4
European	3	..	..	1	74	..	23	2	1	104	328	432
Others	..	...	1	1	3	..	2	1	..	8	3	11
Total ..	24	23	17	34	184	4	54	11	14	365	499	864

ROUTINE WORK IN THE CLINIC

The following table shows the work done during the last 3 years:—

———	1950	1951	1952
1. Blood specimens for Kahn Test ..	22,585	26,765	25,732
2. C.S.F. Examination and Kahn and W.R. ..	638	786	782
3. Dark Ground Specimens	7,192	4,797	4,073
4. Smears for Gonorrhœa	11,381	13,208	15,154
5. Number of total injections	184,921	165,225	169,281
(i) Aquea penicillin G used	6,140 mu	5,438 mu	4,778 mu
(ii) Procain penicillin in oil with aluminium monostearate	11,903 mu	22,349 mu	22,455 mu
(iii) Arsenical Injections	28,103	26,786	25,923
(iv) Bismuth Injections	22,880	21,480	22,384
6. Gonorrhœa for Culture	257	333	473

TREATMENT

Gonorrhœa. Amongst the several medical miracles of the twentieth century, the continued susceptibility of the gonococcus to penicillin has undoubtedly been an outstanding one. In 9,000 cases of acute gonococcal urethritis treated during the last three years in the Social Hygiene Department, there has been an unfailing response to an injection of 300,000 units of procain penicillin in oil with aluminium monostearate. It is believed that about 90 per cent of actively multiplying organisms are killed directly by penicillin and the benumbed 10 per cent become an easy prey to the immunological processes of the host. Only in about 5 per cent of cases do all the benumbed ones not seem to be adequately dealt with by the individual: these begin to multiply again after a lag period of a few days or weeks and cause relapse which responds equally well to another shot of penicillin. Those complicated with non-specific urethritis never clear up with this treatment but yield to different therapeutic measures. Nor is the response to penicillin so dramatic in complications such as arthritis and epididymitis. Needless to state that such complications are becoming rarer. Seldom now is a case of salpingitis met with in the female, but extensive formation of warts in vulva and vagina, and bartholinitis, are still quite common, due perhaps to neglect and ignorance.

Non-specific Urethritis. So far this has constituted about 10 per cent of clinic cases, but there is no doubt that it is very prevalent in Singapore, as more and more cases of this type are being referred to this department by private practitioners after prolonged courses of penicillin, streptomycin, chloromycetin and auromycin. In our experience all these cases clear up on mild low-pressure irrigations and dilatations. These are the cases that still require the somewhat classical investigation with sounds, urethroscope and prostatic massage. The treatment of such cases is essential as they are liable to develop the same complications as cases of gonorrhœa. Once well treated there is seldom any relapse. The ætiology is still unknown but it is believed by some European authorities that virus or 'L' organisms may be the causitive agents.

Syphilis. Except in certain cases in rural areas where weekly or bi-weekly P.A.M. (penicillin *G* in oil with aluminium monostearate) has to be given, the general routine course in the clinics consists of 6 mega units of P.A.M. —2 cc's. every day for 10 days—followed by a course of weekly Bismuth for 10 weeks and 5 Mapharsen (0.04G daily) injections. Fewer relapses and a diminished chance of re-infection are two great advantages of such a combined course in Singapore, where most husbands prefer to be treated by a private practitioner, but refer their wives and children to this department. Infants are treated with penicillin alone. The tertiary cases are more individualised, but both cardio-vascular and neuro-syphilitic patients are treated with penicillin without preparation with a heavy metal. Pat. Iodide still has a place in therapeutics in late syphilis both in ameliorating pain and rapid resolution of pathology.

Lymphogranuloma. Sulpha drugs, T.A.B. vaccine injections, anthiomaline and aureomycin (in esthiomene cases in females) have cured practically all of our cases. Aureomycin has been very useful in ameliorating and healing ulcerative conditions in esthiomene though naturally it cannot resolve the pathology in such conditions.

Soft Sore. Bubœs have always been incised and not aspirated. Healing under sulfa is much quicker after incision.

Granuloma Inguinale. For the last four consecutive years no case of this nature has been reported from any of the clinics of this division.

The attached table summarizes the venereal diseases treated and total attendances during 1952, along with a classification of races.

Venereal disease clinics throughout the world serve both as clearing houses as well as treatment centres for various allied complaints which appear to the patient to be of venereal origin but are not necessarily venereal disease. Just as infant mortality or incidence of malaria in tropical countries is considered to be an index of good sanitation and public health activity in an area, similarly the venereal disease control and propaganda index may well be judged in future by the number of patients reporting to a venereal disease centre for investigation to be eventually diagnosed as non-venereal disease.

A study of the figures and tables indicated in this short report make it clear that while the steady advance in the number of cases coming up for treatment has been maintained making 1952 a record year in this respect, the incidence of syphilis and gonorrhœa seems to be on the decline. This is not the case with non-specific urethritis—an experience in line with other areas.

Under the Medical Plan the present organization will be more than doubled, but it is impossible to accommodate more in-patients at present. The three full-time and two part-time doctors available have their hands more than full in dealing with the present numbers. Under the Medical Plan the out-patient facilities will be considerably improved and increased, while in-patient accommodation will rise from the present 70 beds to at least 120. It must be stressed again that comparative increases do not necessarily mean an increase in the incidence of the disease in Singapore, but to new methods of approach and treatment. These are bringing more and more patients forward. The time has come in fact when present arrangements are proving inadequate to meet the public demand in this direction. In the meantime, in consequence, more attention will be paid to evening clinics and to the travelling dispensary scheme arranged for the rural districts but on an experimental basis so far.

Within the limits of staff and accommodation available the venereal disease campaign in Singapore can be said to have met with a definite success. Far more is being done today to combat the disease than ever before. A tremendous amount remains to be done of course. It is still the contention that progress should be on the present lines—a scheme founded on persuasion and confidence between the patient and the doctor. Compulsory notification and segregation have been advocated again and again, but these ideas do not meet with favour by those who have to deal with the problem locally. Measures of force would mean the immediate destruction of the present scheme, and loss of confidence in the classes most concerned. Accommodation would have to be of a definite prison nature and would without doubt necessitate a very large staff. So a steady advance on present lines is advocated as far as the medical side of the problem is concerned.

Senior Medical Officer, Social Hygiene Division: Dr. L. M. Ram, M.B., B.S., M.R.C.P. (Edin.), D.P.H. (Lond.).

MEDICAL, SOCIAL HYGIENE BRANCH

TABLE SHOWING TYPE OF V.D., MALE AND FEMALE PATIENTS TREATED AT THE MIDDLE ROAD HOSPITAL, TANJONG PAGAR CLINIC AND TRAVELLING DISPENSARY DURING THE YEAR 1952

	IN-PATIENT			OUT-PATIENT				OUT-PATIENT				OUT-PATIENT			
	NEW CASES			NEW CASES				REPETITIONS				TOTAL ATTENDANCES			
	Male	Female	Total	M.R.H. and Tr. D. Male	T.P.C. Male	M.R.H. and Tr. D. Female	Total	M.R.H. and Tr. D. Male	T.P.C. Male	M.R.H. and Tr. D. Female	Total	M.R.H. and Tr. D. Male	T.P.C. Male	M.R.H. and Tr. D. Female	Total
I SYPHILIS:—															
(*a*) Primary	9	17	26	200	112	10	322	1,942	2,568	555	5,065	2,142	2,680	565	5,387
(*b*) Secondary	26	46	72	136	63	24	223	9,145	2,895	1,770	13,810	9,281	2,958	1,794	14,033
(*c*) Tertiary	187	72	259	313	46	51	410	5,520	760	2,367	8,647	5,833	806	2,418	9,057
(*d*) Congenital	5	79	84	19	1	81	101	395	3	2,067	2,465	414	4	2,148	2,566
(*e*) Period not Indicated ..	63	575	638	553	88	400	1,041	8,085	2,249	16,522	26,856	8,638	2,337	16,922	27,897
II OTHER VENEREAL DISEASES:—															
(*a*) Gonnorrhœa ..	6	157	163	1,656	849	185	2,690	5,682	4,672	157	10,511	7,338	5,521	342	13,201
(*b*) Gonnorrhœal Complications ..	19	6	25	39	7	9	55	732	102	59	893	771	109	68	948
(*c*) Gonnorrhœa Ophthalmia ..	..	59	59	1	..	59	60	1	..	6	7	2	..	65	67
(*d*) Soft Chancre	4	7	11	584	352	7	943	4,662	2,857	14	7,533	5,246	3,209	21	8,476
(*e*) Lymphogranuloma ..	8	6	14	106	82	6	194	668	390	11	1,069	774	472	17	1,263
(*f*) Mixed Infections	7	23	30	190	83	28	301	663	1,022	2,188	3,873	853	1,105	2,216	4,174
III INVESTIGATION CASES	129	924	1,053	4,396	1,253	4,013	9,662	11,234	5,728	11,457	28,419	15,630	6,981	15,470	38,081
Total ..	463	1,971	2,434	8,193	2,936	4,873	16,002	48,729	23,246	37,173	109,148	56,922	26,182	42,046	125,150

Note: M.R.H. = Middle Road Hospital.
Tr. D. = Travelling Dispensary.
T.P.C. = Tanjong Pagar Clinic (Docks).

MEDICAL, SOCIAL HYGIENE BRANCH—*continued*

TABLE SHOWING TYPE OF V.D., MALE AND FEMALE PATIENTS TREATED AT THE MIDDLE ROAD HOSPITAL, TANJONG PAGAR CLINIC AND TRAVELLING DISPENSARY DURING THE YEAR 1952—*continued*

Race	IN-PATIENT			NEW CASES			REPETITIONS		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Chinese	308	1,339	1,647	6,065	3,248	9,313	42,178	25,092	67,270
Indian	117	355	472	3,379	509	3,888	23,017	3,106	26,123
Malaysian	31	240	271	1,073	1,018	2,091	4,656	7,373	12,029
Eurasian	1	7	8	98	21	119	513	575	1,088
European	2	..	2	415	..	415	1,190	..	1,190
Others	4	30	34	99	77	176	421	1,027	1,448
Total ..	463	1,971	2,434	11,129	4,873	16,002	71,975	37,173	109,148

CHAPTER TWENTY

MATERNITY AND GYNÆCOLOGY

KANDANG KERBAU HOSPITAL

KANDANG KERBAU Hospital continued as the main centre for all Government maternity and gynæcological work in the Colony. Although the bed strength remained at the same basic level, that is some 240 beds, 190 maternity and 50 gynæcology, excluding cots, the hospital admitted 20,426 cases during the year. This is more than double the 1947 admissions. The number of hospital births averaged over 1,200 per month and again produced an all time record. To ease the overcrowding the length of stay of each patient in uncomplicated cases was curtailed to three days.

During 1951 maternity admissions totalled 17,380 with 15,321 deliveries as against only some 8,000 in 1947.

The continuing low general maternal mortality indicated in the section on vital statistics as compared to any previous decade cannot but be taken as a satisfactory present position and an indication of the advance in medical attention. While the rate at Kandang Kerbau alone was cut by two-thirds over the post-war period, the general rate has also dropped in proportion, and particularly so in the rural areas. That the hospital rate has so fallen is remarkable in view of the phenomenal number of cases which pass through comparatively few beds and the fact that more and more abnormal, difficult and late cases enter the institution. 211 cases arrived after delivery in a deplorable condition during the year.

Cases numbering 3,046, again an all time record, were admitted to the gynæcological wards. 3,367 cases were operated upon (628 of these being treated as out-patients), some returning to their homes the same day.

There has been an interesting increase in the number of Cæsarean operations over the post-war period—288 such operations in 1952 with only 20 to 30 in 1947 and previous years, about half of which were for placenta prævia; 220 cases were delivered with forceps; 592 breech presentations were seen.

Kandang Kerbau Hospital is a free institution except for a small paying block. Here patients can be dealt with by their own practitioners. This system is a necessity in Singapore where private maternity homes cover only a negligible number of beds. With the facilities provided by this hospital, by the rural Government maternity service, and by the City Council maternity service, over half the total births in the Colony are now controlled. The hospital dealt with over 30 per cent of the total births. The rural service covered a large majority of the births in the rural districts.

The following conclusions can be drawn from present experience:—

(*a*) the disappearance of any fear of hospitalization by the women of the Colony and a steadily increasing demand for both in-patient and out-patient treatment. In 1919 only 232 patients sought maternity care: 1,606 in 1929: 6,034 in 1939, 12,678 in 1949 and 17,380 in 1952. An institution designed for 200 in-patients on a ten-day stay and a small antenatal division only, and staff quarters accordingly, can only reach the present record figures with a serious danger of exhaustion and loss of efficiency. The present aim is still to admit all who seek admission however, on the assumption that skilled aid however curtailed, is better than none;

(*b*) the rapidly increasing desire for ante-and post-natal supervision—a most satisfactory feature—which must be met by increased facilities at the earliest possible moment. It is no use having health propaganda without the means to meet it. This is leading to—

(1) the continued reduction in the maternal mortality figure;

(2) the increase in the number of abnormal cases seeking early admission; the increase in the number requiring Cæsarean operation;

(3) the disappearance of destructive operations on the child (decapitation, etc.);

(4) the low forceps delivery figure;

(5) the reduction in eclampsia;

(6) the reduction in transverse presentations;

(7) the increase in the numbers of premature infants seen.

Premature births have received special public attention during the year and the discussion which has taken place has indicated a complete misunderstanding of the position. Until recent times very few institutional premature births occurred and these received little special attention. With the present policy of admitting and giving some attention to as many as possible this position has radically altered. Many more premature infants receive attention and care now, attending the hospital for this purpose. This means overcrowding and unsatisfactory conditions not only in this but in many other ways where an institution is attempting to deal with many times the patients it was ever designed for. Fortunately, prematurity does *not* need the particular attention in Singapore that it does in more temperate climes: nor is cross infection the danger here that it is elsewhere. These were the views of Professor English from over 20 years' experience in this country and are views which have been borne out by post-war experience. Nevertheless, the overcrowded conditions at Kandang Kerbau do give cause for anxiety. The plans for the new extensions which are to start in the new year have taken full cognizance of these particulars, in consequence. In fact, the new proposals have been designed on the most elaborate scale and will conform more than satisfactorily with similar accommodation anywhere. But not much further improvement is possible until this matures. The scheme now under action will mean the doubling of existing facilities in all divisions—maternity, gynæcology and out-patient. The latter will establish a really up-to-date series of ante-and post-natal clinics. There will be two large and most modern operating units, with a further smaller operating theatre, a large X-ray division, air-conditioned labour wards and separate divisions for clean and septic cases. When these plans have been completed the constant present risk of some form of institutional disaster—an ever present danger in chronically overcrowded wards of course—will be eliminated.

Present prematurity figures available in Singapore are of course of little statistical value. What cases should come under this head has never been properly evaluated so far. That Asian and European children weight figures are not strictly comparable has long been understood. In addition many cases which cannot live and barely breathe are classed as premature instead of as still births. So the local still birth rate is very low as compared to such countries as England and Wales (15.4 for Singapore in 1952 and 22.6 for England and Wales in 1950).

OUT-PATIENT CLINICS

In addition to ante-natal, post-natal and gynæcological clinics, there is a clinic for women and children where medical assistance and advice on general ills may be obtained. All these clinics again dealt with a considerably increased number of patients and are becoming widely appreciated amongst the indigent population. Some 9,600 examinations of babies were carried out in the post-natal clinic. The following table gives some indication of the present out-patient provision at this hospital.

Clinic	1947		1949		1952	
	New Cases	Total Attend-ances	New Cases	Total Attend-ances	New Cases	Total Attend-ances
Ante-natal and Gynæcological ..	7,033	24,683	12,665	37,010	16,784	39,737
Post-natal:—						
Mothers	} ..	19,930	..	6,931 {	8,096	8,545
Infants	}				7,733	7,734
Women and Children ..	..	31,908	16,333	49,139	17,365	64,019
Total ..	7,033	76,521	28,998	93,080	49,978	120,035

Routine laboratory examinations numbered 39,481 as against 29,346 in 1950.

The hospital was re-organized on a two-unit system some time ago in an effort to increase the efficiency of the present organization. A third unit will be added when the above plans come into operation.

Work on the new diagnostic X-ray division was commenced towards the end of the year and will be in operation in early 1953. This will supply a long-felt want. So far all such work has been concentrated at the General Hospital in accordance with a carefully worked out and steadily expanding X-ray scheme designed by the late Senior Radiologist Dr. Winchester to provide a most complete and up-to-date Colony organization in this respect by 1953.

The important Central Midwives Board continued its periodic meetings. In particular it dealt with the difficult problem of modernizing the training of midwives and of exercising sufficient control over the work of the midwives in practice already. An up-to-date revised Midwives Ordinance introducing and covering a new scheme of training based on that in the United Kingdom was under review. The difficulty so far has been to include provision for a continuance of the lower standard Malay girl so necessary to the rural areas. The World Health Organization is helping by the provision of an experienced midwifery tutor and adviser until local staff is sufficiently trained in this respect. Scholarships are available in this connection for overseas study after probationary training and experience on the spot. The scheme includes a domiciliary midwifery unit. The difficulty here is that a majority of the population still inhabits cubicles—one-roomed dwellings in dark and overcrowded tenements—which are quite useless in this respect. Thus domiciliary midwifery

can take but a small place in present day Singapore with the best will in the world. This means an inevitable concentration on institutional work in the City with home visiting mainly confined to the rural areas. In fact, this is what is actually happening.

A new Ordinance for the Registration of Nursing Homes and Maternity Homes was also drafted.

As highly qualified midwives must take on more and more of the work previously undertaken by nurses, the new training and all to do with it have a most important bearing on the immediate future.

The Hospital continued to be a part of the Medical School, and students received their maternity and gynæcological practical training here as in previous years. Nurses and midwives continued to receive lectures and practical demonstrations for the certificates of the Central Midwives Board; fifty-four medical students attended the hospital during the year, while thirty nurses and forty-four midwives sat for their respective examinations. The present institution has no space for medical interns, unfortunately, but this difficulty will be remedied under the plans now under implementation. Such residence is essential for post-graduate specialization.

Medical Superintendent: Dr. W. A. Balhatchet, O.B.E., L.M.S. (Singapore).

Professor of Gynæcology and Obstetrics: Professor B. H. Sheares, M.D., University of Malaya: L.M.S., Singapore, M.R.C.O.G. (London).

Gynæcologist and Obstetrician: Dr. A. C. Sinha, L.M.S. (Singapore), M.R.C.O.G. (London).

Senior Assistants: Dr. (Miss) E. V. Crowe, M.B., CH.B., F.R.C.S.E.
Dr. J. W. F. Lumsden, M.A., M.B., CH.B., M.R.C.O.G.

Footnote:—Professor English who was for many years Professor of Midwifery and Gynæcology in Singapore has recorded the following hospital deliveries over the years:—

1915	175		1932	2,146	
1916	195		1933	2,306	
1917	206		1934	2,575	
1918	221		1935	3,548	
1919	232		1936	4,707	
1920	342		1937	5,214	
1921	496		1938	5,551	
1922	466		1939	6,034	
1923	797		1940	6,184	
		(moved to new site)	1941	6,425	(only 300 in December)
1925	588		1942	1,913	
1926	753		1943	2,037	(Japanese occupation)
1927	1,019		1944	1,657	
1928	1,304		1945	1,584	
1929	1,606		1946	5,101	
1930	1,882		1947	7,802	
1931	1,955				

Since then the statistics read as follows:—

1948	10,272	1951	13,582
1949	10,928	1952	15,321
1950	13,238		

THE ALMONER'S REPORT, KANDANG KERBAU MATERNITY HOSPITAL, 1952

Miss R. Mills reports as follows:—

The Almoner's division is a new one in this hospital and was opened in January of this year. The progress on the work was rather slow at first but greatly expanded with the appointment of an interpreter clerk on 30th June. The amount of work covered during the second half of the year was treble that achieved in the first half of the year.

It is quite impossible for one almoner to attempt to cover all the work which should be done in a hospital of this kind. (Queen Charlotte's Maternity Hospital, London, for only 3,000 births per annum and no gynæcological or medical divisions has three almoners and four clerks). An attempt was made to interview the majority of gynæcological in-patients and women who had had abnormal deliveries as these patients are more likely to have social problems. Patients in other wards and in the out-patient's departments are seen when they are referred by the medical and nursing staff. Ideally all pregnant women should see the almoner at least once before the birth of the baby so that any problems which can be anticipated and solved in advance can be dealt with.

All pregnant women going to the Trafalgar Leprosy Home are seen antenatally. The almoners at Tan Tock Seng tuberculosis institution usually notify the almoner of this hospital in advance if social complications are anticipated with an expectant mother from their hospital who is to be admitted to Kandang Kerbau for the birth of her baby.

During the year nearly 400 patients have been registered for help in one form or another. Of these over 300 were Chinese, 22 were Malays, 38 Indians, 7 Europeans and 8 Eurasians. The problems which were presented were extremely varied.

The most difficult and the most responsible work of the division is the adoption of babies who cannot be cared for by their mothers for one reason or another. The policy pursued is to always try and keep mother and baby together and only when this is impossible to arrange for adoption or institutional care. The Social Welfare Department pursues the same policy and is willing to co-operate to this end whenever necessary. Fortunately there are more people wanting babies than there are babies available for adoption and no baby need be unloved or uncared for.

The mortality rate of babies who do not go to their natural mothers on discharge from hospital is high, although experience is bringing to light difficulties leading to better methods for promoting the care of the baby. Out of thirty-six such babies discharged during the year, twelve died, twenty-one are believed to be living and in three cases the result is unknown. Out of the thirty-five mothers (one had twins), thirteen died in hospital, six have gone to Trafalgar Home, five had illegitimate babies (six other illegitimate babies were kept by their mothers), five mothers could not take their babies for medical reasons, two mothers had posthumous babies and four mothers had unwanted babies for other causes. The arrangements made for the babies were as follows:—fifteen were adopted into private homes, ten went to relations and eleven were admitted into institutions. Some families sent their babies to the convents for religious reasons and other babies went to one of the institutions because it was hoped that the baby would either return to its mother or to other relations at a later date. It is interesting to note that all mothers in Trafalgar Home wanted to keep their babies. Three went to institutions and three to relations. There is a belief among the Chinese that babies of leprosy patients will contract the disease and often considerable persuasion and reassurance is needed with relations in consequence. That thirty-six babies only could not be looked after by their mothers is a low figure compared with the size of the hospital. These figures do not include babies of mothers suffering from tuberculosis who take their babies home but who are cared for by some other member of the family, or of women who take their babies home subsequently but give them away to other women. The mortality rate for these babies is not known but there is good reason to suppose that it is considerably lower than when the baby is separated from the mother at birth. Fortunately the natural instinct of a woman is to keep her baby and the great majority want to keep them. It is also often found that when a mother says that she does not want her baby at birth but takes it home with her that she wants to keep it later. The risk that the baby may get into a less good home than if adopted immediately is out-weighed by its increased chances of survival and the likelihood of the mother keeping her baby. The baby's future can be safeguarded by a follow-up visit either by the almoner or the health nurse. The main reasons for women not

wanting their babies are housing, matrimonial difficulties, poverty, widowhood, lack of confidence about being able to rear a baby, superstition, a difficult pregnancy, the arrival of a girl when a boy is wanted, and friendly arrangements made between relations. It is hoped during the coming year to do more detailed research into this most important problem. All babies who are adopted privately or taken by relatives are referred at once to the health sister in the Government or City Council Infant Welfare Clinics for supervision.

During the earlier part of the year a survey was made of all women attending hospital who were on relief. It was found that these women could be divided into two groups: older women with no male relative to support them: women who were widows or separated from their husbands or whose husbands were sick and not able to work. Those in the former group were found to be able to manage on relief only if they were part of a friendly family group. The small amount of money just prevented them from being a complete burden on their friends or relatives, thus relieving them of the necessity of institutional care.

It was found that women who were widows who had young children suffered in time from malnutrition unless they were able to supplement their income in some way. The increased rates proposed after 1st January, 1953, will help. The Public Assistance Section of the Social Welfare Department is willing to give sickness allowances up to six months to widowed mothers and others on relief following child-birth to allow the mother to stay off work to breast-feed her baby if necessary. They are often given a supplementary allowance from the Silver Jubilee Fund as well to help with confinement, so that the position regarding women in pregnancy is considered reasonably good. A widow with small children, however, may be doomed to live on a very small income for a long period unless some means is found of supplementing the income. In some cases a relative, often a grand-mother, will care for the children while the mother goes to part-time work. In other cases where no relation suitable to look after the family is available, the mother is often anxious over leaving her children with neighbours who may also have to be paid for their services, and if she has never worked before marriage she may be afraid to take the initiative.

Following this survey, and after consultation with the medical staff in the hospital, the question of a sickness allowance grant for women who had had serious complications of pregnancy or who had had or were advised to have major operations and who needed an improved diet was discussed with the Secretary for Social Welfare for public assistance so that these women could receive help even if the husband was not eligible for relief. Several women have received temporary help in this way. A total of 159 patients have been referred to the Social Welfare Department for either relief or to the Women and Children's Section or to the Citizen's Advice Bureau for advice.

A quantity of the milk made available under the U.N.I.C.E.F. scheme has been distributed through this office. As it is not suitable for small babies the doctors are reluctant to recommend it for nursing mothers. It is now being given to the children of women who are on relief, especially if they suffer from a complaint due to a poor diet, to improve the general nutrition of the family.

116 patients were visited, making a total of 492 home visits in all. Only a very few of the visits were unsuccessful chiefly because people are used to women visiting and enquiring about babies and will usually co-operate. Where a house is known to be difficult to find a relative is usually asked to come to the office to act as a guide to avoid a waste of time. Home visiting is essential if the work is to be thorough and not superficial but it is difficult for a single-handed almoner to leave the office for long periods and most of the visiting is attempted if possible between 8.30 a.m. and 10 a.m. before patients in the hospital need interviewing.

Because of the nature of the work co-operation is greatest with the Social Welfare Department and the Infant Welfare Centres but 175 cases are recorded where other societies, agencies and persons have been approached. These are far too various to mention in detail but it appears that there is hardly a problem which can confront a woman in this Colony which does not at some time or another find its way into this department.

The training of students is considered to be most important. The visit of Miss Webb, Head Almoner of University College Hospital, London, to the hospital was most welcome and her suggestions and the details of the new scheme for practical training of students in England were received with great interest. Great care is taken to ensure that the training which students receive in this hospital is not less thorough than that given to students in England. During the year two students undertook a period of training in the division. One has been transferred to the General Hospital to continue training there: the other has gone to England for a post-graduate course. It is hoped that the training of students will be further developed during next year.

CHAPTER TWENTY-ONE

TRAFALGAR HOME SETTLEMENT

In 1951 the name 'The Leper Settlement' was officially changed to 'Trafalgar Home'. This name took its origin from the rubber estate on which the Settlement has been built.

Dr. R. J. Grove-White, M.D., M.R.C.P. (E.) was Medical Superintendent throughout the year and Dr. R. S. Corbitt was resident Medical Officer until October when his place was taken by Dr. M. D. Goulding. In addition, the non-inmate staff consists of two Hospital Assistants, two Religious Nursing Sisters, one G.C.S. clerk, two hospital servants, three watchmen and one van driver.

INMATE STAFF

The strength of the inmate staff has been increased to 206 as compared with 162 in 1951. This has been necessary to keep up with the expansion and development of the Home. All routine camp duties are performed by the inmates under the supervision of two inmate supervisors who are responsible to the resident Hospital Assistant-in-charge.

There are twenty inmate dressers and ten nurses employed in the hospital wards under the supervision of two Religious Sisters of the Franciscan Mission.

The salary rates of the inmate workers were again revised during 1952. These rates can be considered to be satisfactory for those inmates residing in the camp who have no dependants outside, but the problem of dependent families is one which has not yet been touched. The relief section of the Social Welfare Department at present only allows these ordinary public assistance rates. Some further scheme to be worked either through the Social Welfare Department or within the Trafalgar Home will be necessary in order to cope with the many problems which arise on this account. There is no doubt that the present absconding rate (4.4 per cent) is largely due to the desperate plight of the families of the patients concerned when they find themselves unable to continue treatment and will risk transmission of the disease to their families rather than allow them to suffer physically in other ways.

DEVELOPMENT OF THE TRAFALGAR HOME UNDER THE MEDICAL PLAN

The 41 blocks of semi-detached houses started in 1951 under the second stage of the plan were completed in April 1952 and were fully occupied at once, so relieving the overcrowding which had by that time become extreme. So 69 quarters housing 276 persons of the three stage scheme have been completed. The rest of the second stage of development, namely 2 two-storeyed wards and the out-patients department could not be undertaken in 1952, but it is hoped that work will begin on them early in 1953.

The Rotary Club of Singapore has as its Community Service objective for the year a hall and school for children in the Trafalgar Home. Tenders were called for in September and the building was started at once. It has five classrooms in addition to office accommodation for the teaching staff and a covered-in recreation space for the children. Three of the classrooms are divided by folding doors which when run back open up a hall capable of sitting about 200 inmates. A cinema projection room has been incorporated in the building and in such a manner that 16 mm. films can be shown in

the hall, and an open air cinema for 35 mm. films can also be worked. Mr. H. Brunnier, President of Rotary International, who was passing through Singapore in December laid the corner-stone on the 8th of that month. This corner-stone also commemorates Mr. K. L. Engelmann, President of the Singapore Rotary Club for 1951/52, who died suddenly a few months after relinquishing the chair in June this year. Mr. Engelmann had been deeply interested in this project and it was decided to commemorate his name by calling the Community Hall after him. By the turn of the year the building had reached roof level and it is now expected that it will be completed by the end of February 1953.

FURTHER EXTENSION OF THE CAMP UNDER THE MEDICAL PLAN

The site of the plan for the third stage of development was revised during the year to obviate the necessity of closing a public right-of-way and a more compact design has now been achieved. This design also gives room for further extension if and when required. There is no doubt that the full extent of the third stage will be required whether or not the patients from Singapore who are at present in the Leprosaria of the Federation are returned to the Colony eventually. The object of the present scheme is 'a community within a community', concentration rather than actual incarceration. That this policy is paying dividends is evidenced by the very large numbers of cases, and especially early cases, coming forward, particularly over recent times, instead of going underground as previously. Thus at the end of the year apart from the 724 patients actually housed in or around the Home and the 300 housed in the Federation, 393 clearly non-infectious cases were under active out-patient treatment only with another 113 under observation—a total of 1,530. The plan envisages an increase in non-inmate staff housed near the Settlement although self-help is the keynote of the present development.

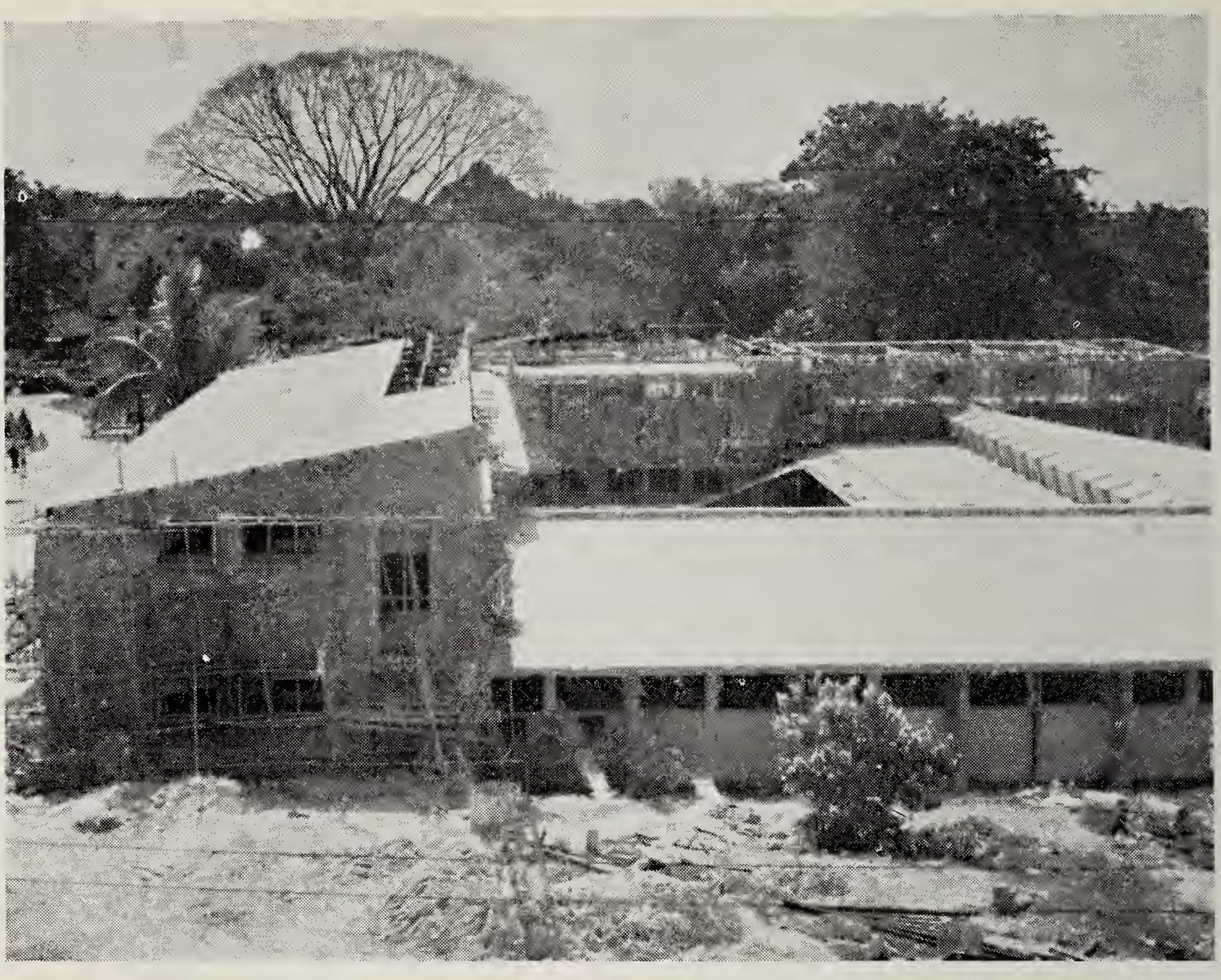
OCCUPATIONAL AND DIVERSIONAL THERAPY

The services of Miss Martin, Occupational Therapist in the Medical Department, were obtained for Trafalgar Home in June 1952. She also extended her work to the blind patients in Tan Tock Seng Hospital. She reported as follows:—

> The work of Occupational Therapy with the patients of Trafalgar Home was started in June 1952 with the hope and aim of providing occupation for those who are particularly badly affected and so assisting them towards rehabilitation. During these seven months the work has progressed steadily and with some very encouraging results. Among the patients whose hands have lost much of their usefulness there has been a definite increase in range and power of movement, together with greater skill in the handwork which they have learnt. There is a real pride in the results of their efforts: the initial resistance to something new has lessened.
>
> As the treatment of leprosy is exceptionally long there is the problem of maintaining the patients' interest in the work, especially as the number of possible crafts is limited. Basket work and handloom weaving provide the best exercise, as the movements are large and both hands must be used. Later on it is hoped that a department will be opened which will provide space for more equipment and so increase the variety of craftwork.
>
> Finished articles are autoclaved as a precaution against infection, and in December we were successful in selling most of the work finished. The profits from this sale were divided up, each patient receiving $3.
>
> Payment for individual effort would give much more satisfaction than a share in general profits, and patients would gain a measure of independence while remaining within the settlement. Something on the basis of a sheltered workshop would be a great step towards rehabilitation in providing regular work, rates of payment varying according to a patient's capabilities, with a suggested maximum of $15 a month.

Holiday Bungalow for Nurses

Nurses at play



General Hospital—New Out-patients' Department in course of construction

Public Relations

The Tuberculosis Out-patient Rotary Clinic at Tan Tock Seng Hospital

Public Relations

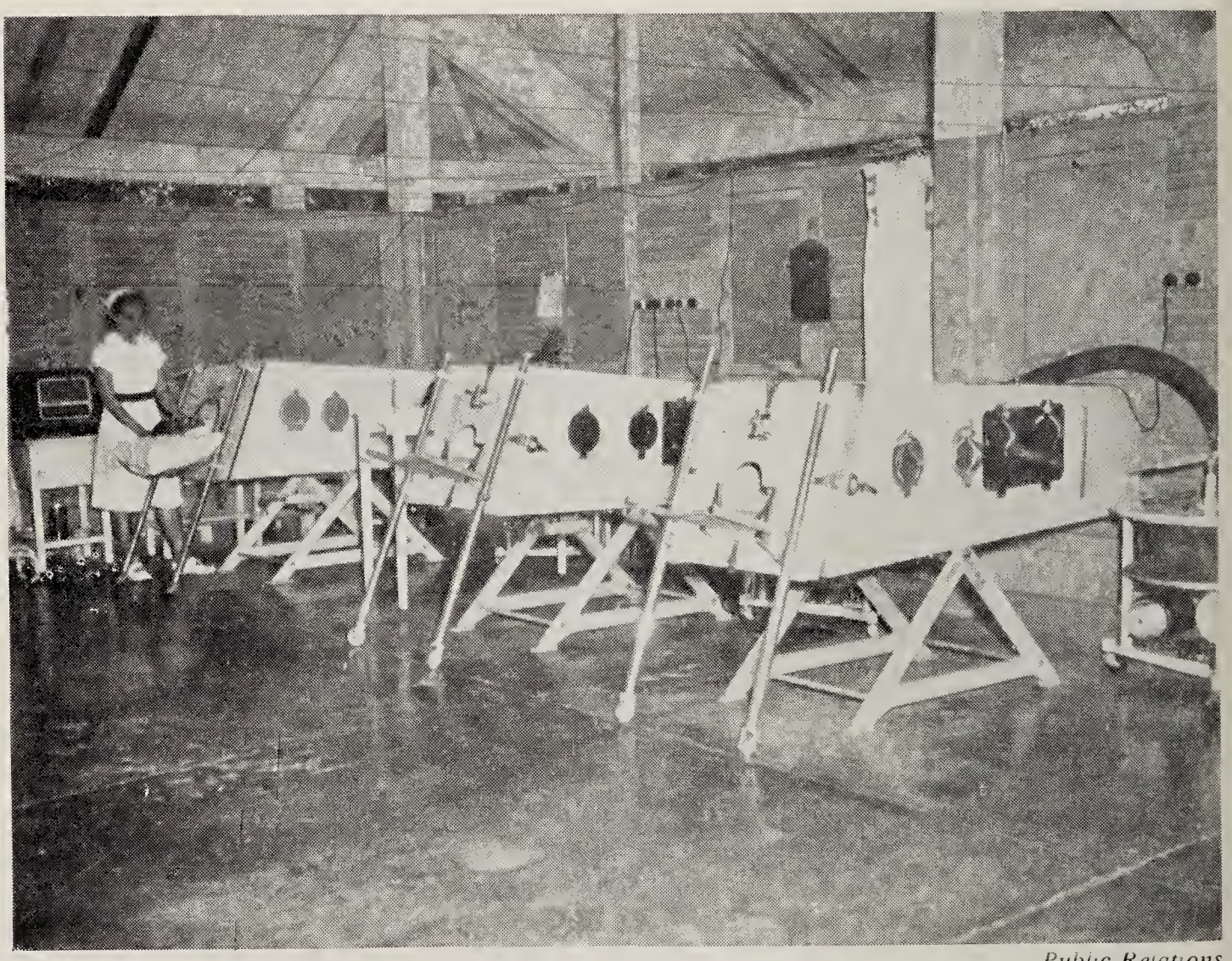
A Maternity Wing of the Kandang Kerbau Hospital

Public Relations

Woodbridge (Mental) Hospital

Public Relations

Post-polio Treatment in the Special Post-polio Unit at Middleton Hospital



Public Relations

A part of Singapore's battery of Iron Lungs and Chest Respirators

SCOUTING AND GUIDING

Scouting flourished throughout the year but guiding suffered a serious setback with the resignation of Miss Eastaugh, the Almoner, who found that she was unable to continue the Guide company. However at the end of the year another volunteer came forward in the person of Mrs. Colton and we hope that in 1953 the troop will be re-established.

SCHOOL

The school has made excellent progress and its ninety-nine children are divided into five classes under Mr. G. D. Champion. The school had the good fortune to acquire the services of two inmate trained teachers and a trainee during the year. One of these was ultimately discharged but the benefit of his experience was of great value in getting the school properly established, and when it moves into the new accommodation it will be serving a very valuable part in maintaining and improving the education of children who have to spend part of their education period in isolation. As children from the school were discharged during the year they were found alternative accommodation in outside schools. As our standards improve we hope that it will be of no disadvantage to the child's education if it has to be isolated on account of this disease.

TRAFALGAR HOME WELFARE COMMITTEE

At the end of 1951 plans were already far advanced in forming a new association which would stimulate public interest in the welfare of patients suffering from leprosy, and in January the Singapore Leprosy Relief Association was established under the presidency of Canon Adams. It took over all the previous functions of the former Trafalgar Home Welfare Committee. It has undertaken further to be the medium through which the Rotary Club is building the Community Hall for the Home.

There are two representatives of the Medical Department on the Council of the Association to ensure close liaison with the Government—these being the Almoner and the Medical Superintendent.

Christmas time was a memorable one for the patients of the Home. The Singapore Leprosy Relief Association gave a party for all the inmates on the 20th December and the Franciscan Sisters at the Home organized a children's party on the afternoon of the 21st. In addition the Singapore Standard Toy Fund visited the children under the auspices of an excellent Santa Claus.

ALMONER'S REPORT

The appointment of an Almoner to the Home was approved in the estimates for 1952, but so far it has been impossible to recruit a full-time lady for the purpose. An attempt has been made to partly meet the need by the Almoner of Tan Tock Seng Hospital spending one day a week at the Home, or dealing with out-patients at Tan Tock Seng Hospital.

The most important social problem affecting the treatment of all the patients who are infectious and forced to enter Trafalgar Home, or who are so severely handicapped or marked as to be unable to work, is the financial support of their families. The sudden loss of any wage-earner for several years is a major disaster to a family, and can only be tolerated when the condition of the sick person has reached such an advanced stage that he no longer has any earning capacity. Because of this situation there are undoubtedly still people in the infectious stage of leprosy who refuse to come forward for treatment, and who continue to mix freely with the rest

of the community. Others who are brought to the Home by the authorities abscond in order to return to their families and take their share in providing the necessities of life.

In 1953 the Social Welfare Department is commencing an increased general relief rate with a corresponding increase in sickness rates where the sick man remains in his own home. It would be of great assistance if in cases of long-term sickness where it is of such obvious advantage to the community that the sick man or woman should be removed from the position where he or she can infect others, that the family should not suffer, by the complete cessation of sickness rates, and especially where young children make it impossible for the wife to work. Even so, the rates of relief are very low and it is useless to press for early treatment of the disease until it is possible to promise every sufferer from this disease that care will be taken of his needy family if he takes treatment.

Another equally difficult problem is that of the employment of the cured leprosy case. Within the Home there are roughly three groups: the severely sick who are nursed in the Hospital wards: the fairly fit but severely handicapped, and the less handicapped. In the first group all those who are without friends or families to assist them are eligible for a monthly pocket money allowance from the Social Welfare Department; and since the beginning of the year over sixty patients have been receiving this. In the third group a large number are employed in duties about the home and receive a small monthly wage from the Medical Department. Others find occupation in farming etc., but there still remains a very large group which spends its days, year in and year out, without any occupation. Uneducated, these cannot read or write; perhaps so maimed that they know they will spend the rest of their lives in the Home. In such a state of forced inactivity the general morale is quickly sapped. So the Occupational Therapists' work is of immense value, but the desire to work soon fades without some small reward. It is most important that some form of sheltered workshop should be established for these isolated people. In such a place payment would be by result and in some cases it would be possible for a man to maintain his family from within the Home. Arrangements for well-equipped workshops have been made for the prisoners at Changi, where every criminal has the opportunity to learn several different trades. It would be of great value if a similar scheme could be inaugurated for the patients of Trafalgar Home.

The problem of the after-care of the cured and discharged patient is very closely related to the provision of a sheltered workshop. Many patients are so maimed that they will never be able to maintain themselves in the general community. Others are so marked that prejudice makes their life a misery. With such a place of employment many could live outside and come to work daily. Still more important, such a centre could become a place of training for the handicapped young unable to return to heavy labouring. These with a skilled craft at their back might well return and be useful members of the community. At present nothing constructive is being done to relieve the community of the burden of supporting these people for the rest of their lives.

Where treatment is so prolonged and the danger from failure to attend for injections and inspection may be so disastrous, a very strict after-care follow-up is necessary. The Almoner has for the past year visited all the homes of the children before their discharge and attempted to follow up with home visits where the child does not attend for its treatment; but the routine follow-up on health grounds is a nursing problem, and there is urgent

need for the appointment of a Health Sister (whose post on the establishment has already been approved) to supervise such work and deal with the problem of the contacts.

When patients are attending as out-patients for weekly injections, many may be in considerable financial difficulty. The Almoner has at her disposal a small fund to meet emergencies and pay fares. It is important that patients should be given every encouragement to continue their long and arduous treatment, and when money is very short even a dollar is grudged on transport to hospital. Several children were found not attending because they had to walk two or three miles each time.

In the routine course of her duties the Almoner has seen every new patient admitted to the Home in the past year and nearly every patient due for discharge. Gradually a brief survey is being made of every patient in the Home and many home visits have been carried out.

AN ANALYSIS OF THE INMATE PATIENTS OF THE HOME

During the year a review of all cases in the Settlement has been made in an endeavour to obtain a fair picture of the in-patient leprosy problem. Shortage of staff since the war and the rapid growth of the Trafalgar Home have delayed this very important investigation. From this review an analysis has been made and the pictographs below indicate the general position.

The first pictograph shows the duration of isolation of all the inmates of the Home. It will be seen that the great majority have been admitted only during the past 5 years while there are a smaller number who are distributed over the previous 20 years. This indicates the rapid growth of the Home, and a possible increase in incidence as a result of the complete breakdown of isolation arrangements and the lowering of nutrition standards during the period of the Japanese occupation. The picture is exaggerated as a result of the reduction in the transfer of patients from Singapore to Penang settlement since 1950. A total of 300 patients were transferred between the years 1947–50 to assist in easing the shortage of accommodation. Nearly all these cases were newly admitted, and so their distribution would fall between 2–7 years back, although many of them were relatively far advanced in regard to their disease.

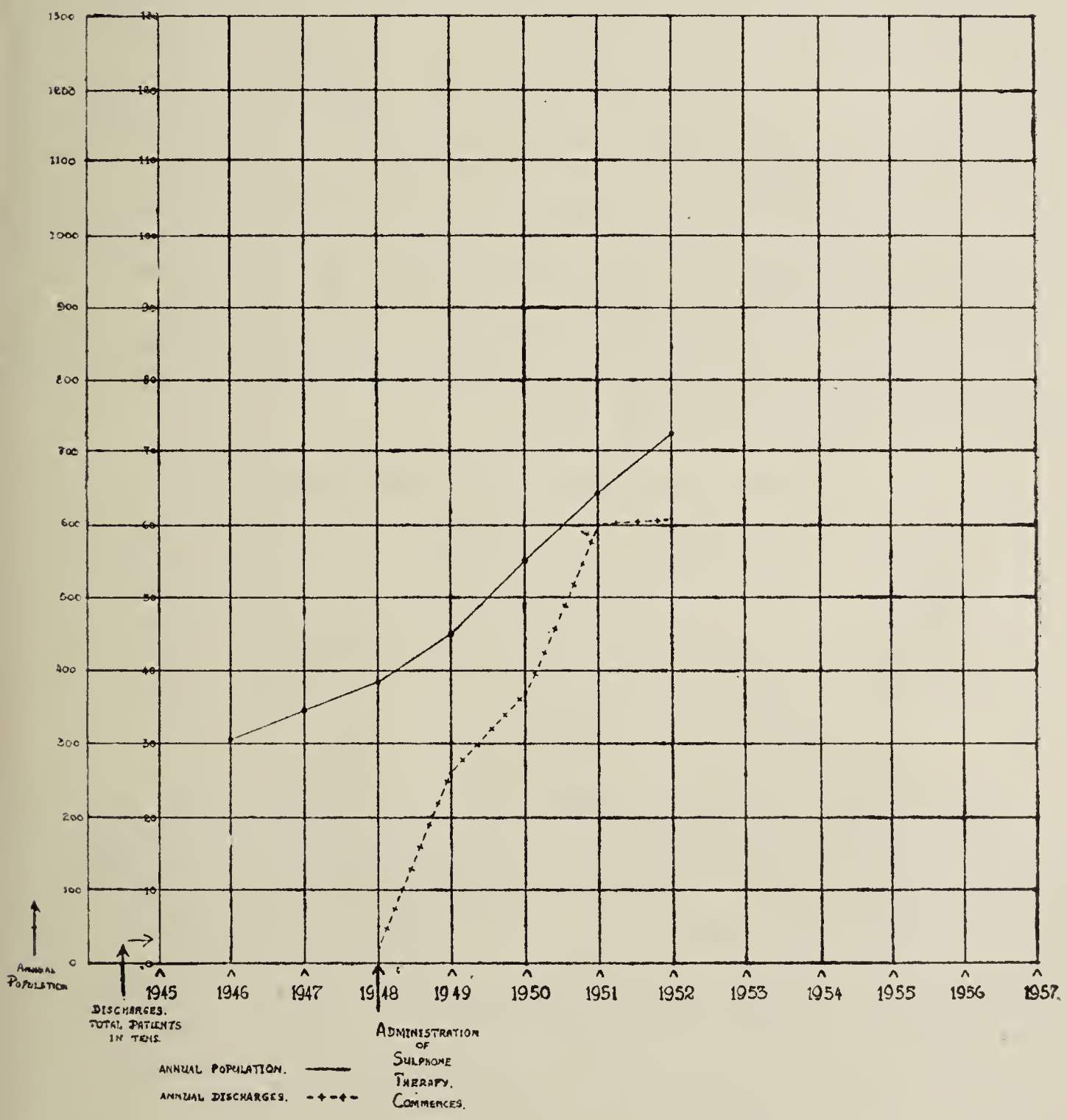
Patients' histories have been examined and all cases re-questioned on the stated duration of their disease. The largest group sought treatment within one year of contracting the disease, but relatively few within three months. Some on the other hand have allowed the disease to drag on for years before seeking help. These figures have not yet been broken down to find out whether modern treatment is bringing patients to the authorities earlier in the hope of obtaining a cure but this is thought to be an important factor.

Graph (2) shows the population increase in the Trafalgar Home from 305 in 1946 to 725 in 1952. To this should be added the 300 at present in the Settlement of the Federation.

The introduction of sulphone therapy in January 1948 is also marked on the graph and it will be seen that since that time there has been a steady increase in the number of patients becoming fit for discharge. These in the first place were mostly patients with tuberculoid lesions, but the lepromatous cases are now coming forward as fit for discharge. It will be seen too that in the first three years after the introduction of sulphone therapy roughly 10 per cent of the total population became fit for discharge (the graph roughly parallels that of the population increase). However in 1952 although the population has further increased the discharge rate has fallen and it is interesting to examine the reasons for this.

GRAPH SHOWING LENGTH OF STAY IN TRAFALGAR HOME, SINGAPORE
POPULATION—DECEMBER 1952 = 724

GRAPH SHOWING ANNUAL POPULATION—DISCHARGES IN TRAFALGAR HOME, SINGAPORE, FROM 1946 TO 1952



During the year 10 cases who were marked as fit for discharge and some actually brought before the Leprosy Board and given their certificates, returned to the camp as unable to support themselves outside, either due to deformities of their limbs or such disfigurement that they could not obtain employment and were helpless and starving on readmission. Many others had refused discharge. At present over 10 per cent of the 724 population (75 persons) are bacteriologically fit for discharge but unwilling or unable to go due to excessive disfigurement or disability. An examination of those who are bacteriologically positive brings the figure 75 to 299 of the 724 population who are so disabled or disfigured that they are unlikely to be able to support themselves in life outside the settlement and so must be regarded as permanent residents. Any suggestion that leprosy with modern treatment will soon become a solved problem must be dismissed as wishful thinking; the problem must be considered in terms of generations rather than years. These figures must be considered in relation to the Almoner's report which is given above. This is the first year during which the Almoner's department has been able to devote any appreciable time to the leprosy problem. Its valuable services have been greatly appreciated by the patients.

The Singapore Leper Relief Association is keenly interested in the project of a sheltered workshop and the administration is co-operating in the closest manner with it in this respect.

TOTAL BED STRENGTH ON 31ST DECEMBER, 1953

	Male	*Female*	*Total*
Adults	435	192	627
Children	53	44	97
	488	236	724

TREATMENT

The standard treatment adopted in the Trafalgar Home is that of Diaminodiphenyl Sulphone 'Dapsone' by injection. Sulphetrone dissolved in water (20 per cent solution) is the next most frequently used. Sulphetrone tablets are used in a few cases but so far Diamino-diphenyl-sulphone has not been used by mouth. During the year supplies of Tebacyl and Isoniazid (Rimifon) were obtained and used on a trial group of patients. Tebacyl is less toxic than the methyl thiosemicarbazone (T.B. 1) and is at least as active. It is therefore a drug of value in cases which will not tolerate D.D.S. Isoniazid on the other hand did not prove of any material value in our hands in the treatment of leprosy other than for its tonic effect and its use in the treatment of concurrent tuberculosis.

The following is a resumé of the treatment carried out:—

Total number of patients	724
Total number of patients on Sulphone in Oil Injection ...	463
Total number of patients on Sulphetrone in water Injection	174
Total number of patients on Sulphetrone Tablets ...	21
Total number of patients on Thiacetazone Tablets ...	10
Total number of patients on Rimiform Tablets ...	15
Total number of patients on Diasone Tablets	2
Total number of patients on Tebacyl Tablets	12
Total number of patients on Hydnocarpus Injection ...	—

COMPARATIVE TABLE OF CASES DISCHARGED AS NON-INFECTIOUS

Year	*Male*	*Female*	*Total*
1949	16	10	26
1950	37	17	54
1951	43	17	60
1952	46	10	56

TREATMENT FOR LEPROSY OUT-PATIENTS

Sulphone in Oil	371
Sulphetrone Tablets	4
Hynocarpus Injection	3
Thiacetazone Tablets	15

CHAPTER TWENTY-TWO

OTHER SPECIAL DEPARTMENTS

DIVISION OF RADIOLOGY

DURING THE first half of the year Dr. W. B. Young acted as Senior Radiologist, Singapore, in addition to his appointment as Radiologist, Tan Tock Seng Hospital. In June Dr. D. R. McPherson B.SC., M.B. CH.B. (GLAS.) D.M.R.E., D.T.M. & H. assumed charge of the division.

Dr. McPherson reports as follows:—

1952 saw a further increase in the work covered by the X-ray division of the Government Hospitals in Singapore. The progressive increase in the annual advance of radiological work is clearly indicated by the following figures:

1938	... ...	6,000 cases	
1947	... ...	17,562 cases	
1948	... ...	21,562 cases	
1949	... ...	30,069 cases	
1950	... ...	45,718 cases	
1951	... ...	52,199 cases	plus 5,801 screened at Tan Tock Seng Hospital and an unspecified number at General Hospital.
1952	... ...	62,062 cases	plus 7,084 screened at Tan Tock Seng Hospital and an unspecified number at General Hospital.

In the Radiotherapy section 331 patients were treated. This is an increase of 55 per cent over the 1951 figure of 214.

SECTION OF DIAGNOSTIC RADIOLOGY

Installations

Most of the new apparatus required for the modernization of the diagnostic departments in Singapore has arrived, and at the end of the year its installation was nearing completion. As the new Buildings at Kandang Kerbau Hospital are not yet erected the equipment there is housed temporarily in a converted storeroom. The modernization and extension of the X-ray Departments were planned by my predecessor and when complete early in 1953 will provide the following facilities:—

General Hospital

Room A: A new modern 500 m.a. unit fully equipped for all ordinary radiodiagnostic work. Special equipment for radioscopy, gastro-intestinal examinations and planigraphy.

Room B: One high-power and two low-power units for routine radiography especially of traumatic cases.

Room C: A new 500 m.a. unit for special examinations with a special table for head radiography.

Orthopædic Department: One medium-power unit with couch and Potter-Bucky diaphragm. One portable low-power unit.

Out-patient Department: When the new Out-patient Department is complete a low-power mobile unit will be installed so that immediate examination of cases of suspected injury can be carried out.

In addition four other mobile units are available for examination of patients in the wards.

Tan Tock Seng Hospital

Room A: One photo-fluorographic unit. One new 500 m.a. unit with Potter-Bucky couch and upright Potter-Bucky stand.

Room B: New medium-power unit with facilities for planigraphy and for fluoroscopy and serial radiography.

In addition facilities for fluoroscopic examinations are provided in the Chest Clinic and at Mandalay Road Hospital.

Kandang Kerbau Hospital

A new 400 m.a. unit complete with Potter-Bucky couch and upright Potter-Bucky stand.

A low-power mobile unit.

Woodbridge Hospital

A 200 m.a. unit complete with Potter-Bucky couch and upright Potter-Bucky stand.

A low-power mobile unit.

Part of the new apparatus was purchased to meet the requirements of the Civil Defence Scheme. Its use in existing hospitals has the double advantage of providing services which are needed, and of keeping the equipment in good condition and ready for use in an emergency.

Considerable structural alterations have been carried out in connection with these new installations and their ancillary dark-room equipment. In addition a new film drying room and patients' lavatory have been built at the General Hospital.

RADIOTHERAPY SECTION

Throughout the year there was a list of patients requiring radiotherapy. Provision for the purchase of additional equipment has been made and accommodation has been provided for its installation.

Installations: No major changes were made in the equipment during the year, but a separate room was provided for the apparatus for medium and superficial therapy, and an air-conditioning plant was installed. New radium applicators for ophthalmic and naso-pharyngeal work and a plaque loaded with strontium 90 were ordered but had not arrived by the end of the year. Strontium 90 is a radioactive isotope produced at the Harwell plant of the Atomic Energy Commission, and it has many advantages over radium for betaray therapy.

Patients in the General Hospital are dealt with in their Units, but those from Kandang Kerbau (Women's) Hospital are accommodated at the General when necessary. Under the reorganization expansion plan of the General Hospital a bed unit will be provided adjacent to the Radiology Division. Action on this and on the extension and modernization of Kandang Kerbau will proceed early next year.

When the apparatus to be provided in 1953 arrives the position in regard to radiotherapy will be as follows:—

One 400 kilovolt super voltage unit.

One 140 superficial therapy unit.

Two 250 kilovolt deep therapy units.

One contact therapy unit.

Radium to the following quantity is available at the General and Kandang Kerbau Hospitals:—

General Hospital

95 milligrammes in needles. (Radium).

Radioisotope

15 milligrammes of Cobalt 60.

5 milligrammes of Strontium 90.

Kandang Kerbau Hospital

Radium—220 milligrammes.

This will complete the plan undertaken by my predecessor. The time will then have come to explore the further use of atomic therapy in the treatment of malignant disease in Singapore.

TEACHING

A course of twenty lectures was given to medical students in the University of Malaya, and a shorter course to Dental Students. Students are also encouraged to attend screening and reporting sessions throughout the year.

Figures of chief examinations performed during 1952 in Diagnostic Section.

GENERAL HOSPITAL

	1952	*1951*
Chest	14,307	14,656
Bronchography	93	93
Gastro-intestinal Tract (Barium Meals and Enemas)	1,288	1,171
Renal Tract	862	677
Gall Bladder	226	226
Heart	293	305
Pregnancy including Pelvimetry	471	473
Salpingography	4	9
Encephalograms	39	55
Bone and Joints (*a*) Injury	6,558	4,931
(*b*) Pathology	5,206	4,186
Sinuses	760	656
Teeth	22	27
Others	311	326
Tomographs	15	—
Total ...	30,455	27,791
Average per month ...	2,538	2,316

TAN TOCK SENG HOSPITAL

	1952	*1951*
Chest (Large films)	23,727	18,327
Chest (Photofluorography)	7,347	5,971
Other examinations	533	110
Total ...	31,607	24,408
Average per month ...	2,634	2,034
Fluoroscopic screen examinations of Chest—		
X-ray Department	184	1,232
T.B. Clinic	6,900	4,200

DEEP X-RAY THERAPY

Malignant Disease	*1952*	*1951*
Post Nasal Carcinoma (Lympho-epitheliona, Squamous Epithelioma, transitional cell growths, etc.)	63	39
Head and Neck: Scalp, Parotid, Thyroid, Pituitary, Antrum and Larynx	10	15
Oral Carcinoma (Tonsil, Cheek, Tongue, etc.)	7	14
Breast	11	9
Uterus	9	5
Lymphoblastomas: Hodgkin's disease, Leukæmia, etc.	22	12
Skin and Soft Tissues	5	18
Sarcoma of Bone	2	2
Miscellaneous	29	6
	158	120

Benign Conditions		
Osteoclastoma	1	2
Ankylosing Spondylitis	28	9
Hæmangiomas	10	7
Miscellaneous	5	—
	44	18

	1952	*1951*
SUPERFICIAL THERAPY		
Rodent Ulcers	10	10
Keloids	23	16
Hæmangiomas	1	7
Papillomata	22	9
Skin Diseases (Eczema, Acne, etc.) ...	67	18
Hyperthyroidism	2	4
Miscellaneous	4	—
	129	64
RADIUM	20	12
Total ...	331	214

Twenty patients were treated with radium-either in the form of interstitial implants or as surface radiation using moulds.

INFECTIOUS DISEASE

Middleton Hospital, the only institution specifically reserved for infectious disease in the Colony apart from the Quarantine Station, admitted 1,796 cases to its 250 beds during the year as compared to 2,317 in 1951. No case of plague, cholera or small-pox was observed for the fifth consecutive year.

The following table gives an indication of the principal conditions dealt with over the period:

Diseases	Remaining 31–12–51	Admitted	Dis-charged	Died	Remaining 31–12–52
Chicken-pox	8	450	445	..	13
Measles and Rubella ..	4	151	148	7	..
Diphtheria	17	427	343	80	21
Diphtheria Carrier.. ..	1	55	55	..	1
Meningococcol Meningitis ..	..	2	2	..	..
Enteric Group of Fevers ..	33	124	143	6	8
Typhoid carrier observations ..	9	24	33	..	..
Acute Ant. Poliomyelitis ..	34	50	36	8	40
T. B. Meningitis	1	6	4	3	..
Amœbic Dysentery ..	7	92	96	2	1
Bacillary Dysentery ..	1	22	23	..	..
Clinical Dysentery ..	..	9	8	..	1
Diarrhœa and Enteritis ..	1	14	10	5	..
Erysipelas	1	3	4	..	..
Whooping Cough ..	..	3	2	1	..
Mumps	..	15	15	..	..
Diseases found not to be suitable for this hospital ..	3	158	150	8	3
Observations	1	191	190	..	2
Total ..	121	1,796	1,707	120	90

Enteric

117 typhoid cases were admitted during the year. With 33 cases remaining on 31st December, 1951, a total of 150 cases was treated. Six cases died, a case fatality rate of only 4 per cent. The causes of death were as follows: — one intestinal hæmorrhage, four toxemia, one cardiac failure.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number of Admissions	21	14	14	11	10	14	2	2	9	6	6	8	117
Number of Deaths ..	..	..	..	1	2	1	..	..	..	2	..	..	6

Typhoid fever broke out in a mild localised epidemic form in December 1951 with 39 admissions. This was followed by 21 admissions in January, 14 in February and 14 in March. The outbreak was traced to a common source of infection, a wedding dinner. Of the 100 guests 30 contracted typhoid fever, and 22 were admitted for treatment. Eight food handlers were immediately isolated for investigation. These were released with negative results, although one of them showed a positive Vi I agglutination titre of 1/320 in his blood serum but the typhoid bacillus was not found in his stools or urine.

About the 20th April, 1952, five cases of typhoid fever were admitted, all employees of a local firm. The history was that they fell ill about the same time after attending the annual staff dinner of the firm on 8th March, 1952. Investigations by the City Health Department revealed another 15 employees reporting sick about the same time. Further investigations showed that at this dinner two separate caterers, a Cantonese and a Hokien, supplied the food, and all those who became ill took the Hokien food which was prepared by the same caterer as for the wedding. Another round up of all the employees of this establishment was carried out and among the suspects one was definitely proved to be a typhoid carrier, excreting typhoid bacillus in his stools persistently. This carrier was missed in the first round up as he was not living on the premises. He was detained in the hospital for more than 2 months, and given a full course of treatment. On discharge, he was prevailed on to change his calling.

The treatment of typhoid with Chloromycetin continues to give gratifying results. The same dosage of 25 gms. spread over a period of 14 days is still being followed.

Diphtheria

427 cases of clinical diphtheria were admitted during 1952, 57 more than 1951. With 17 cases remaining at the end of 1951 a total of 444 cases were treated during the year.

Types of cases	Admissions	Deaths
Laryngeal and Tracheal	170	65
Nasopharyngeal	56	9
Faucial or Tonsillar	192	6
Nasal	9	...
Total ...	427	80

Contact carriers 55

ADMISSIONS AND DEATHS BY RACE

Race	Admissions	Deaths
Europeans	1	...
Eurasians	5	...
Indians	16	...
Chinese	392	75
Malays	11	5
Others	2	...
Total ...	427	80

ADMISSIONS AND DEATHS BY AGE GROUPS

Age	Admissions	Deaths	
1 year below	67	26	74
1– 2 years	97	18	
2– 5 years	161	30	
5–10 years	70	4	
10–15 years	19	2	
15–20 years	5	...	
Above 20 years	8	...	
	427	80	

ADMISSIONS AND DEATHS BY MONTHS

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions ..	40	27	31	48	28	34	47	45	39	30	23	35	427
Deaths	8	6	13	11	5	3	11	3	5	5	5	5	80

Of the 427 cases of clinical diphtheria admitted 80 cases died, a crude case fatality rate of 19 per cent. Out of the 80 cases, 49 died within 24 hours of admission and if these are excluded the corrected death rate will only be 7 per cent. Tracheotomy was performed on 126 cases or 29.5 per cent of the admissions, almost one in every three cases admitted into the hospital. Of these 126 tracheotomy cases, 61 died equal to 40 per cent and of these 51 deaths, 28 cases died within 24 hours after tracheotomy.

The number of cases is a considerable increase over the average of recent years (220). In consequence very strong action is being taken to boost the immunisation campaign. Facilities are available in both rural and city clinics for preventive immunisation but the procedure is not popular. In addition many parents will not bring their children for the second essential dose. Its real importance is shown in the very high proportion of cases seen in the below 5 age group where most of the mortality occurs. Diphtheria is a preventable disease which can be eradicated by mass immunisation of the child population. This has been definitely established in such countries as the United Kingdom where the response to immunisation has been excellent, with a consequent and remarkable drop in the incidence of this dangerous disease.

ACUTE ANTERIOR POLIOMYELITIS

Admissions and Deaths by Months

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Cases	3	2	5	8	7	2	1	7	4	7	2	2	50
Deaths	..	..	..	1	..	1	..	..	2	1	1	..	6

AGE AND SEX DISTRIBUTION AND TYPES OF CASE

Age		0–1 year		1–2 years		2–5 years		5–10 years		10–15 years		15–20 years		20–30 years		30–40 years		40–50 years		Total	
Sex		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Paralytic	C.	8	3	10	3	7	4	5	2	1	1	..	..	..	1	1	2	..	..	32	16
	D.	..	..	..	..	..	1	3	..	..	..	..	..	..	..	1	1	..	..	4	2
Non-paralytic	C.	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1
	D.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	C.	8	3	10	3	8	4	5	2	1	1	..	..	..	2	1	2	..	..	33	17
	D.	..	..	..	..	..	1	3	..	..	..	..	..	..	..	1	1	..	..	4	2

Fifty cases of poliomyelitis were admitted during the year with 6 deaths. Altogether 7 bulbar cases had to go into the mechanical respirator and 5 of them died. Of the 2 survivors one, a pregnant woman, delivered a full term live baby. Two of the bulbar cases were flown by air from Bangkok.

Thirty-six out of the 50 cases were in children under 5 years of age with the disease more common in males. A high percentage of the cases were paralytic in nature.

Special thanks are due to the British Red Cross Society. Besides many gifts of toys and books to the patients, it has taken a particular interest in the older polio children who have remained hospitalised for a long period of time. The Society also provided a school teacher.

Other Diseases

158 cases were admitted suspected of one or other of the Infectious Diseases but on investigation were found not to be so. Of these 8 cases died, the causes of death being beri-beri 2, broncho-pneumonia 3, pulmonary tuberculosis and tuberculosis enteritis 2 and encephalitis 1. The other cases were either discharged or transferred to other hospitals.

The Infectious Diseases Hospital continued to be run under the dual control of Government and City. Dr Ng See Yook, L.M.S., D.P.H., was the Medical Superintendent.

MENTAL DISEASE

The outstanding feature of 1952 was the increase in the number of persons admitted for treatment: 977 as against 660 in 1951. The number under treatment at the end of 1952 was 1,733, compared with 1,427 a year before. There is every indication that the number of persons requiring hospitalisation for mental trouble will continue to increase for some time to come in spite of the efforts of the staff to ensure adequate treatment and early discharge. 576 patients were discharged during the year, a rate of 59 per cent of direct admissions—an improvement on figures elsewhere. Only 95 patients died.

The only solution to what is becoming a serious accommodation problem appears to lie in the direction of more outside care for mild cases by relatives and friends. An extension of the present mental hospital is of course a part of the Medical Plan.

Treatment

Physical methods continued to be used on an increasing scale, 112 being treated by insulin shock and 985 by electric shock. A total of 8,949 such treatments was given.

Physical methods of treatment are not new to Singapore. In 1931 the malaria treatment for General Paralysis was introduced; in 1936 insulin shock was first used in a small way, and in 1939 shock treatment by cardiazol was begun. The war and the Japanese Occupation delayed the introduction of electric shock therapy until 1947, when the equipment was obtained from England.

Occupational therapy was continued with success. This form of treatment is now an essential in any mental institution. Rotan work and woollen and cord articles are made and much carpentry and painting is done by male patients. Some 1,400 articles were made or repaired in this way. Female

patients made 4,200 articles in the sewing rooms and laundered 51,500 items, relieving the tremendous pressure on the hospital laundry. The tailor's shop either made or repaired 40,072 articles.

The farm, another form of occupational therapy, was extended to 51 acres. Two tractors were introduced: these facilitated ploughing and preparing of land for planting with crops. 107,708 lb. of vegetables were harvested, a very considerable increase over any previous year.

It is the intention to further increase the scope of all types of occupational therapy as a definite part of the expanding treatment scheme. Such treatment has been quadrupled over the last two years.

Dental treatment was given regularly to patients with very good general results. 642 received such assistance. Dental sepsis is of course very often a major factor in ill health.

The laboratory continued to carry out routine investigations as required. New equipment to expand its activities has been installed and still more is on order. 6,549 examinations of various kinds were carried out.

A library for the use of patients has been installed. There are already 551 books available, and gifts of books will be welcomed.

A new Mental Disorders and Treatment Ordinance came into force towards the end of the year. It embodies the latest English modifications of the law in dealing with mental disorder and introduces the voluntary patient.

An increase in the number of persons suffering from neuroses and psychoneuroses has been noted, conditions more suitable to the out-patient clinic. As the Medical Plan advances it is hoped to add some such addition to the present facilities of the General Hospital. The 1951 Annual Report drew particular attention to the general need of proper out-patient facilities in all our institutions.

Final year students of the Faculty of Medicine attended a course of lectures and demonstrations in Mental Diseases during the Michælmas term.

The need for more trained mental staff has been explained in previous Annual Reports and in particular the need for additional nursing staff. Perturbation has been expressed at the reliance which has to be placed on the nursing orderly or attendant in our mental institutions—a legacy of past policy. Unfortunately we shall have to continue to rely on this system—however undesirable—for a long time to come. More staff quarters will lead to more qualified nurses—both male and female—but the attendant trained by experience must be the mainstay until the acute hospitals have sufficient nursing staff. In consequence a new scheme for mental attendants and probationers was worked out and introduced during the year which it is hoped will improve the efficiency of the present control.

At the end of the year the hospital was much better staffed and served than ever before but even so only 5 doctors excluding the Medical Superintendent, 1 Matron, 10 Sisters, 4 male nurses, 4 qualified nurses (female) and 10 hospital assistants were available. There were 436 attendants and 100 probationer attendants.

The numbers of patients by race remaining in the hospital at the end of the year are as indicated in the following table.

Medical Superintendent:

Dr. J. Browne, M.D. (Q.U. Belfast), D.P.M.

Acting Medical Superintendent for a part of the year:

Dr. B. F. Home, L.R.C.P. & S. (Edin.), L.R.F.P. & S. (Glas.), Diploma in Psychological Education.

WOODBRIDGE HOSPITAL

PATIENTS BY RACE 1952

Race	Remained on 31–12–51		Admitted during 1952		Total treated		Discharged		Died		Remained on 31–12–52	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
European	3	1	11	5	14	6	12	3	1	..	1	3
Eurasian	8	7	6	5	14	12	6	6	..	1	8	5
Chinese	687	508	476	271	1,163	779	284	126	55	22	824	631
Indians	93	29	97	5	190	34	77	10	6	1	107	23
Malays	69	21	83	12	152	33	44	6	6	3	102	24
Japanese	..	..	1	..	1	..	1	..	..	..	..	..
Jew	..	..	1	1	1	1	..	..	..	..	1	1
Others	..	1	..	3	..	4	..	1	..	..	..	3
Total ..	860	567	675	302	1,535	869	424	152	68	27	1,043	690

PATHOLOGY DIVISION

The work of the division includes:—

(1) Autopsies (H.M. Coroner and hospital cases) at the General, Tan Tock Seng and Kandang Kerbau Hospitals.

(2) Histological examinations of biopsy and autopsy specimens from the Government hospitals, clinics, dispensaries and private practitioners.

(3) Bacteriological investigations of specimens from Government hospitals, clinics, dispensaries and private practitioners.

(4) Serological tests of blood and cerebro-spinal fluids from Government hospitals, clinics, dispensaries and private practitioners.

(5) Preparations of T.A.B. cholera and autogenous vaccines for the use of Government hospitals, clinics, dispensaries and private practitioners.

(6) Maintenance of a museum of specimens of pathological and medico-legal interest.

(7) The carrying out of Friedman tests for pregnancy.

(8) Maintenance of stock cultures of bacteria.

It is to be noted that the work carried out by the division is not representative of Singapore as a whole as similar investigations are made at the City Laboratories, and large numbers of clinico-pathological, biological, and hæmatological investigations are carried out in the clinical laboratories of the individual hospitals.

Teaching

As was the case in 1951 the major part of the teaching of pathology to medical and dental students in the University of Malaya had to be undertaken by members of the division. The posts of Professor of Pathology and three senior appointments have not yet been filled. The number of students attending during the year was 90 (Medical 50 and Dental 40).

The teaching of Forsensic Medicine was carried out by the senior assistant (Dr. L. S. da Silva). 48 students attended the course.

TOTAL NUMBER OF YEARLY INVESTIGATIONS

	1950	*1951*	*1952*
1. Post-mortems	1,706	1,876	1,889
2. Histological examinations ...	3,353	3,260	4,673
3. Bacteriological examinations ...	10,247	10,854	13,764
4. Serology	36,607	40,421	38,097
Total ...	51,913	56,411	58,423
Post-mortems of H.M. Coroners cases	831	849	966

The Senior Pathologist was in charge of the Government division and continued to act as Head of Department of Pathology, University of Malaya throughout the year. Mr. Cheah Heng Huat who has been on study leave in the United Kingdom returned in November.

With the ever increasing amount of routine investigations, and the very important but exhausting task of teaching large numbers of students, the Senior Pathologist and his staff of 6 Government and 1 University qualified assistants have had little opportunity of conducting any extensive research in the many interesting pathological problems encountered. Provision has been made in the 1953 Estimates for an additional Assistant Pathologist and the idea is to add further staff as opportunity offers.

GENERAL

Post-mortem Examinations

A total of 1,889 necropsies were performed, an increase of 13 on the 1951 figure. The number of Coroner's cases was 966, 52 per cent of the total.

Table from Pathological Reports

AGE, SEX AND RACE INCIDENCE OF AUTOPSIES ON ALL DEATHS (CORONER AND WARD CASES)

Age	Chinese		Indians		Malays		Others		Total		1952 Grand Total
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Under 1 year ..	301	223	9	9	4	5	2	2	316	239	555
1–10 years	133	117	4	2	6	1	1	..	144	120	264
11–20 years	69	26	2	..	7	..	1	..	79	26	105
21–30 years	70	42	16	5	10	2	8	2	104	51	155
31–40 years	124	48	39	7	4	..	5	2	172	57	229
41–50 years	136	45	23	2	5	..	6	..	170	47	217
51–60 years	139	26	20	1	5	2	11	..	175	29	204
61–70 years	63	15	8	1	..	1	1	1	72	18	90
Over 70 years ..	23	10	..	..	1	1	1	..	25	11	36
Total ..	1,058	552	121	27	42	12	36	7	1,257	598	1,855
Autopsies on Decomposed Corpses ..											34
Grand Total ..											1,889

The beneficial effects of modern preventive and therapeutic measures commented on in the Report for 1951 is again demonstrated by the small numbers of cases of preventable disease coming to the post-mortem room and is shown in the following table:—

	1951	*1952*
Tuberculosis	154	143
Malaria	7	2
Beri-beri	19	12
Amœbiasis	12	12
Bacillary Dysentery	7	7
Typhoid	8	4
Diphtheria	7	7

A decrease was also noticed in the incidence of malignant tumours, there being 83 cases compared to 103 in the previous year. There was a small increase in the cases of caustic soda poisoning, 41 compared with 34 in 1951, while vehicle accidents recorded 136 deaths, an increase of 21 on the figure for 1951.

Histology

4,673 sections were examined during the year, an increase of 1,413 on the previous year's figure (3,260). 288 autopsy blocks, however, still awaited investigation at the end of the year. Until the staff position improves it will not be possible to prevent such arrears of work accumulating.

Bacteriology

13,764 bacteriological examinations were carried out during the year, an increase of 2,913 on the figure for 1951 (10,851). These examinations included 3,424 cultures (321 positive) and 177 animal inoculations (13 positive) of suspected tuberculosis material. The production of vaccine was very considerably increased, chiefly for stockpiling and emergency purposes. The total output, mostly T.A.B. and Cholera, was 98,035 c.cs. The output for 1951 was only 16,480 c.cs. Friedmans test (for pregnancy) was carried out in 92 cases with 45 positive, 44 negative and 3 doubtful results. Improvements have been made in various techniques particularly in the isolation of C. diphtheria, Salomenella and Clostridia.

In this direction D. tetani was detected in two cases of mechanical abortion.

120 stock cultures of Oxford and local strains, in duplicate sets, were maintained during the year.

Serology

A total of 38,097 specimens (36,234 blood and 1,863 cerebro-spinal fluids) were received for investigation, a decrease of 12,324 on the figure for 1951 (40,421).

So far no complete statistical study on the incidence of malignant disease in the Colony has been possible but the Chief Health Officer reports as follows on figures available.

The results of necropsies carried out at the General, Kandang Kerbau, and Tan Tock Seng Hospitals are shown in the table below:—

MALIGNANT TUMOURS (NECROPSIES 1947–1951 AT THE GENERAL, KANDANG KERBAU AND TAN TOCK SENG HOSPITALS, SINGAPORE)

Year	*Number of Tumours*	*Number of Necropsies*	*Number of Registered Deaths*
1947	40	1,013	3,326
1948	73	1,080	2,741
1949	84	1,320	3,242
1950	92	1,644	3,589
1951	110	1,825	3,548
Total ...	399	(5.8% of 6,882 Necropsies)	16,446

In 1952 out of a total of 1,889 necropsies, 83 showed malignant disease.

INCIDENCE OF MALIGNANT TUMOURS BY RACE, SEX AND AGES

Race *Number and Percentage*	*Sex* *Number and Percentage*	*Age* *Number and Percentage*
Chinese 358 (89.75 per cent)	Male 328 (82 per cent)	0–10 years 21 (5.25 per cent)
Indians 26 (6.5 „)	Female 71 (18 „)	10–20 years 19 (4.75 „)
Malays 6 (1.5 „)		20–30 years 19 (4.75 „)
Others 9 (2.25 „)		30–40 years 61 (15.25 „)
		40–50 years 135 (34.0 „)
		50–60 years 106 (26.50 „)
		60–70 years 35 (8.75 „)
		Over 70 years 3 (0.75 „)

MALIGNANT TUMOURS (NECROPSIES 1947–1951)

	Incidence by Site
Uterus	2 (0.50 per cent)
Cervix	3 (0.75 „)
Breast	3 (0.75 „)
Nasopharynx	17 (4.25 „)
Oesophagus	25 (6.25 „)
Stomach	70 (17.5 „)
Large intestine	30 (7.50 „)
Liver	82 (20.50 „)
Broncho-pulmonary	45 (11.50 „)
Glioma	23 (5.75 „)
Leukaemia	19 (4.75 „)
Others	80 (20.0 „)

It was thought that an analysis of post-mortem examinations carried out on coroners' cases would reveal some significant features. In a total number of 950 such cases analysed malignancy was observed in 12 only. The following table gives the race, age and sex distribution.

ANALYSIS OF CORONERS' CASES IN 1952

Age Group in Years	CHINESE				MALAYS				INDIANS				OTHERS				MALES		FEMALES		TOTAL		Malignancy Percentage
	MALES		FEMALES		MALES		FEMALES		MALES		FEMALES		MALES		FEMALES								
	Coroners' Cases	Malignancy	Coroners' Cases	Malignancy	Coroner's Cases	Malignancy	Coroners' Cases	Malignancy	Coroners' Cases	Malignancy	Coroners' Cases	Malignancy	Coroners' Cases	Malignancy	Coroners' Cases	Malignancy	Coroners' Cases	Malignancy	Coroners' Cases	Malignancy	Coroners' Cases	Malignancy	
0–9	104	..	69	..	10	..	4	..	4	..	8	..	..	..	..	..	118	..	81	..	199	..	..
10–19	48	1(*a*)	20	..	5	1(*b*)	..	..	3	..	1	..	1	..	2	..	57	2	23	..	80	2	2.5
20–29	42	..	27	1(*c*)	9	..	..	..	12	..	4	..	9	..	..	..	72	..	31	1	103	1	0.97
30–39	74	1(*d*)	32	1(*e*)	5	..	2	..	32	..	4	..	5	..	1	..	116	1	39	1	155	2	1.3
40–49	92	1(*f*)	27	..	4	..	..	..	23	..	3	..	4	..	..	..	123	1	30	..	153	1	0.65
50–59	95	3(*g*)	21	..	4	..	2	..	13	..	1	..	8	..	..	..	120	3	24	..	144	3	2.08
60–69	56	1(*h*)	19	..	..	..	1	..	7	..	1	..	1	..	1	..	64	1	22	..	86	1	1.16
70	16	2 (*i*)	10	..	2	..	1	..	..	..	1	..	..	..	..	..	18	2	12	..	30	2	6.66
Total ..	527	9	225	2	39	1	10	..	94	..	23	..	28	..	4	..	688	10	262	2	950	12	1.26

(*a*) Lymphosarcoma age .. .. 10 years.
(*b*) Carcinoma Thymus age .. 15 years.
(*c*) Chorionepithelioma age .. 22 years.
(*d*) Carcinoma Oesophagus age .. 39 years.
(*e*) Carcinoma Stomach age .. 34 years.
(*f*) Primary Carcinoma Liver age — 44 years.
(*g*) Two cases of Carcinoma Stomach ages 50 and 55 and one primary Carcinoma Liver age 52 years.
(*h*) Carcinoma Stomach age 63 years.
(*i*) One Carcinoma Stomach age 71, and one Carcinoma Lung age 72 years.

Coroners' cases include not only those due purely to accidents and murders but also suicides and other cases. Obviously, a large percentage of these cases must be subject to self selection. In consequence an attempt was made to analyse only those which had died purely as a result of injuries such as road hazards, act of God, murders, and gun shot wounds. Among a total of 226 such cases not a single case of malignancy was observed in post-mortem examinations. The figures are admittedly small but they are suggestive nevertheless. The age distribution of these cases is tabled below:—

AGE DISTRIBUTION OF CORONERS CASES DUE TO INJURIES OTHER THAN BY SUICIDE

Age Group in Years	*Cases*
0 - 9	14
10 - 19	23
20 - 29	41
30 - 39	44
40 - 49	37
50 - 59	36
60 - 69	23
70 +	8
Total	266

The population of Singapore is a very young one and it is growing younger as the years pass. Incidence of cancer therefore in such a community cannot be as great as in a more mature population such as that in the United Kingdom.

During the year 512 persons were registered as having died of malignant disease. While 991 cases were returned diagnosed as malignant disease during 1952 biopsy examinations revealed the presence of true malignancy in 595 persons in 1952, 306 in 1951 and 289 in 1950.

The race, sex and site incidence of these cases are given in the following table:—

INCIDENCE OF MALIGNANT TUMOURS, BY SITE, RACE AND SEX (BIOPSY)

Site *Number and percentage*		*Race* *Number and percentage*		*Sex* *Number and percentage*	
Cervix-Uteri	124 (21 per cent)	Chinese	489 (82 per cent)	Male	257 (43 per cent)
Uterus	12 (2 ,,)	Indian	49 (8 ,,)	Female	338 (57 ,,)
Breast	49 (8.5 ,,)	Malay	18 (3 ,,)		
Oesophagus	11 (2 ,,)	European	29 (5 ,,)		
Stomach	15 (2.5 ,,)	Eurasian	7 (1.5 ,,)		
Colon	13 (2.5 ,,)	Others	3 (0.5 ,,)		
Rectum	15 (2.5 ,,)				
Lymphœpithelioma	97 (16.5 ,,)				
Liver	21 (3 ,,)				
Rodent ulcer	22 (3.5 ,,)				
Spindle cell sarcoma	18 (3 ,,)				
Mixed parotid tumour	17 (3 ,,)				
Others	181 (30 ,,)				

Senior Pathologist: Dr. C. Subrahmanyam, L.M.S. (Singapore).

BLOOD TRANSFUSION SERVICE

General

The Blood Transfusion Service has continued to expand during 1952. While the demand for blood increased considerably, again following the post-war trend, the donations received proved to be just sufficient to meet this added demand. No patient needing blood was ever refused it, and the aim is always to keep at least a week's supply, 80–100 pints, in the Bank. 4,551 donations were received and 4,404 transfusions were given as against 3,695 received and 3,119 given during 1951.

The Service is still housed in a totally inadequate part of the Department of Pathology, but the new building now being constructed for this specific purpose is nearing completion. Plans have been made to ensure that the Unit will be a completely self-contained and independent one, with adequate facilities for the reception of donors, for laboratory work and for the making, cleaning and sterilization of apparatus.

In April a sister supervisor with special experiencre in this work was appointed on a contract basis and in October a Medical Officer with special training arrived from the United Kingdom on a short term contract.

Donors

Once again the European businessmen, the Government Servants, and Servicemen have been the most reliable and generous donors, but it is gratifying to report that the local population is at last coming forward in increasing numbers, and there has been a better response from relatives and friends of patients.

That there has always been sufficient blood in the Bank to meet its requirements is again due to the increasing efforts which the staff have to employ in the contacting of donors.

The attached table gives an analysis of the donors and recipients for the year and shows that while the number of Chinese recipients (3,448) continues by far to exceed that of the Chinese donors (1,356), all the other communities gave more blood than they received. A great deal of propaganda has been used in an attempt to counteract the fear, superstition and apathy that appears to prevent the Chinese community from meeting its responsibilities in this matter. Only increasing efforts and time will overcome these unfortunate tendencies.

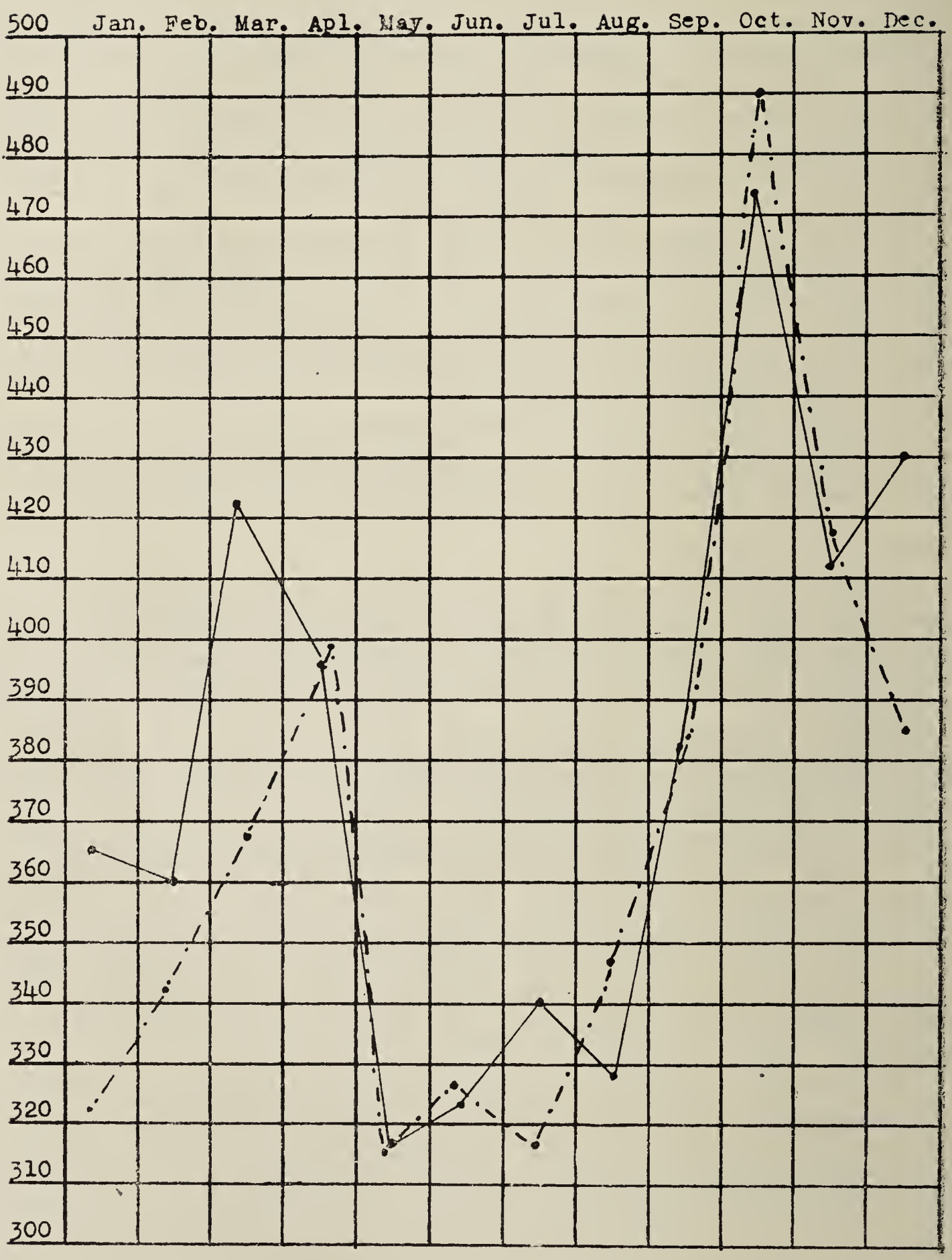
The policy of making no charge for blood transfusion and the giving of no monetary rewards for donations continues. Most donors appreciate the measures taken for their comfort and well being, and the token certificates, badges and medals they receive. 51 Silver Medals for ten donations apiece and one Gold Medal for twenty donations were awarded. Again the East Asiatic Co., Nestles, Malayan Tobacco Distributors Ltd. and Sime Darby & Co., Ltd., generously provided beer, Nescafe, milk, Milo, cigarettes and Bourn-Vita for the donors, and this is greatly appreciated.

The majority of donors came to the Centre, but a 'mobile unit' was also used with success.

Publicity

The English and Vernacular press and Radio Malaya continued to help all through the year by giving publicity in the form of reports, features, photographs, appeals and weekly publication of the Blood Bank balance.

GRAPH SHOWING DONORS AND RECIPIENTS 1952



Donors_____

Recipients_._._._._._

An 'Appeal Week' in March, when firms gave advertising space in the newspapers and the Public Relations Department distributed posters, film slides in cinemas and so on had a limited success in enrolling new donors. Experience would appear to indicate however that sustained publicity and the more personal approach are more satisfactory than shortlived campaigns. It is hoped to appoint a Chinese 'Donor Organizer' in due course who will make a direct contact with members of Chinese firms, factories, clubs, etc. It is hoped to find and tap new sources of donors in this way as an increasing flow is ever necessary. Two 16 mm. films have been bought from the Ministry of Health in the United Kingdom and a start has been made in showing these to groups of students, to Youth Clubs, etc. Donor finding must continue to be one of the most important and difficult tasks of this division of the medical organization of the Colony.

Technical Work

Routine work has gone on as formerly, but has steadily increased in volume. After the visit of the Medical Officer in charge to laboratories and Regional Blood Transfusion Services in England in August, and the arrival of a second Medical Officer in October the laboratory work was re-organized and brought into line with the newer methods now being used in England.

The blood of all members of the staff has been typed to provide a panel of known cells for the purpose of identifying antibodies. More detailed records about the blood of donors and recipients are being kept, and it is hoped that in the future some research will be undertaken, and useful and interesting statistics will be recorded.

A series of 5,000 Chinese donors and patients were Rhesus tested and of these 7 were found to be Rh. (D) negative, i.e. .14 per cent. The figure for the Europeans is 16 per cent. In only one case was an anti-D antibody found in a Chinese mother whose baby had died of Icterus Gravis Neonatorum. This is probably the first case recorded in Malaya.

The help and advice of the staff of the Blood Group Reference Laboratory in London has been requested and received on several occasions, and is greatly appreciated.

No case of a reaction due to blood group incompatibility has been reported, but pyrogenic reactions continue to occur. It is hoped that when more adequate facilities are available for the preparation of solutions and the making and cleaning of transfusion apparatus these will be further reduced.

The pattern of blood taking and giving sets is being slightly altered so that these will be identical with those in general use in England. Sets for saline and other intravenous transfusions are also made up, and the demand for these has increased considerably during the year.

The attached table shows how the blood given was distributed. At present all the laboratory work is done in the Blood Transfusion Service Laboratory at the General Hospital. In addition a refrigerator is kept at Kandang Kerbau Maternity Hospital for matched blood, and group 'O' blood both Rh. negative and Rh. positive is kept there for emergency use.

A twenty-four hour service has been maintained throughout the year, a technician being on duty or on call to match blood out of office hours. Group 'O' emergency blood is always readily available at the General Hospital.

Although nothing spectacular has been achieved in the blood transfusion field during the past year it has been one of steady progress. It is expected that with the augmented staff and the improved facilities which will become

available in 1953 the Blood Transfusion Service will continue to play its essential and increasing role in a still more efficient way in the expanding Medical Services of the Colony.

Blood Transfusion Officers:

Dr. (Miss) M. M. H. Gibson-Hill, M.R.C.S. (England), L.R.C.P. (London); Dr. R. C. H. Wells, B.SC. (Hons.), M.B.B.S., M.R.C.P. (London).

Donors	Male	Female	Total No.	Recipients	Male	Female	Total No.
European ..	1,650	153	1,803	European ..	45	43	88
Chinese ..	1,284	72	1,356	Chinese ..	1,105	2,349	3,454
Indian ..	503	8	511	Indian ..	164	315	479
Malay ..	462	3	465	Malay ..	68	230	298
Eurasian ..	291	41	332	Eurasian ..	19	44	63
Others ..	80	4	84	Others ..	14	8	22
Total ..	4,270	281	4,551	Total ..	1,415	2,989	4,404

Service personnel:	
British	1,060
Others	299
Relatives:	
Taken	798
Offered and rejected	168
New donors	2,737
Voluntary donors offered and rejected ...	156

ANALYSIS OF DISTRIBUTION

General Hospital	2,245
Kandang Kerbau Maternity Hospital ...	2,032
Tan Tock Seng Hospital	24
Youngberg Memorial Hospital ...	63
Trafalgar Home	8
Middleton Hospital	7
Mandalay Hospital	1
Woodbridge Hospital	1
Asian Hospital, Naval Base	14
R.A.F. Changi	7
Private Doctors	2
Total ...	4,404

Year	*Donors*	*Recipients*
1947	996	725
1949	2,946	2,550
1951	3,695	3,119
1952	4,551	4,404

PRISON HOSPITALS

(a) Pearl's Hill Prison

The standard of health and cleanliness in the Prison were of a high order throughout the year. There was no epidemic of any kind. There were 57 cases of pulmonary tuberculosis, 1 of chicken-pox, 107 of venereal disease, 2 of mumps and 14 of leprosy.

The medical officer treated an average of 15 out-patients a day during the first half of the year, and an average of 60 during the second half of the year. The sudden increase was due to the large number of opium taking cases brought to the Prison. These figures do not include the Warders and their families treated as out-patients.

The hospital assistant dealt with about 150 cases daily on his rounds.

The average daily number of prisoners in the whole Prison was 793. A total of 1,183 cases were admitted to the Prison Hospital during the year, giving an average of 56.43 cases per day. This compared with a daily average of 42.3 for 1951.

A total number of 55 patients were transferred to the General Hospital, 3 to Woodbridge Hospital, 9 to the Trafalgar Home and 1 to the Middleton Hospital.

There were six deaths in the Prison, three due to Pulmonary Tuberculosis, the others due to uræmia, coronary thrombosis and subarachnoid hæmorrhage.

The hospital assistant vaccinated 6,007 and inoculated 318 during the year. All comers to the Prison were vaccinated as a routine.

The out-patient clinic opened in 1951 for the treatment of Warders and their families was well attended in 1952. There was an average of 11 out-patients daily, excluding Sundays and holidays.

The Medical Officer (Dr. Naranjan Singh, L.M.S. (Singapore)) comments as follows on opium cases:—

> The peace and tranquillity of the prison was broken by the sudden influx of large numbers of opium cases, 1,512 being admitted during the year (43 of which were females).
>
> All the female opium cases were Chinese, and all the males except for 6 Northern Indians, 2 Southern Indians and 1 Malay. The majority were in the 30–50 age group. The vast majority were undernourished (body weight less than 100 lb.). Most of them had been taking opium for 8–25 years, or more. The average daily consumption was $3 worth of opium. A small percentage (about 6 per cent) took from $10 to $30's worth a day. (At the current market price $5 will buy 1/10 tahil of opium). Almost all the addicts belonged to the lower strata of society (manual labourers, trishaw-peddlers, boatmen, fishermen, hawkers, shop-assistants, painters, carpenters, etc., etc.) and they smoked away or consumed 50–95 per cent of their daily earnings. About 75 per cent were smokers, while 10 per cent were swallowers, the rest combining the two. It was found that nearly 30 per cent took opium in the hope of curing some ailment such as cough, diarrhœa, V.D., asthma, stomach pain, etc. Of these a total of 77 were found on admission to have pulmonary tuberculosis. These cases were, on release, sent either to S.A.T.A. or Tan Tock Seng Hospital.
>
> Thus far it is too early to assess the ultimate benefit of imprisoning these addicts. A good assessment could only be made after following up these cases for a year or two after release from prison.
>
> It is most important to stress that the treatment received in the prison alone will not be of much ultimate benefit. Unless these people are deprived of further opportunities of obtaining the drug on release, nearly all (95 per cent) will revert to the habit.
>
> A start has been made by the Prison Authorities in following up specially selected cases for a year. This will be done by the Social Welfare Department, which will visit their homes once a week for the first three months, and then monthly for the rest of the year.
>
> Thus far, it is satisfactory to note that 90 per cent of all opium takers imprisoned for a month or more gained from 2 to 8 lb. in weight. Those who underwent sentences of less than a month did not generally improve in weight.

(*b*) *St. John's Island*

The Medical Officer visited the detainees and staff at St. John's Island weekly. The average number of patients seen per visit was 8. The hospital assistants treated an average 6 patients per day.

Dental Treatment

The Dental Surgeon paid weekly visits to Pearl's Hill and to St. John's Island where he treated 734 and 197 cases respectively. Of these 515 were extractions, 290 fillings, 8 dentures for the Prison, and 86 extractions, 116 fillings, and 4 dentures at St. John's Island.

(*c*) *Changi Prison*

As in previous years the Medical Superintendent of Kandang Kerbau Hospital (Dr. W. A. Balhetchet, O.B.E.) was in charge and responsible for the

health and sanitation of the Prison. He was assisted by two hospital assistants and several prisoner orderlies. The Chief Dental Officer paid weekly visits to Changi and attended those sent to him by the Medical Officer. Only work of an urgent nature, e.g. extractions and filling was done.

In addition, the Medical Officer looked after the health of the staff, their wives and families, and during the year 947 such cases were seen and treated.

Health and Diet. The health of the Prison can be reported on as very satisfactory. There has not been a single case of infectious or contagious disease during the year.

Every week the Medical Officer does a round of the whole Prison and every offender is inspected, any minor ailment or complaint being seen and attended to immediately. It can safely be said that the present day offender is in a better state of health than when he first came into prison.

The daily average number of offenders was 492 as against 724 last year, the number of cases admitted to the prison hospital being 210 as against 276 for the previous year, with a daily average of 17 in hospital. The daily average in hospital would be smaller if not for the pulmonary tuberculosis patients who were permanent patients.

During the year 37 pulmonary tuberculosis patients were treated, the large majority being chronic cases requiring very little treatment other than rest and nourishing food. These were given occupational therapy such as sewing on buttons and mending clothes. Many of them have improved and put on weight. During the year one died, 21 being discharged, leaving 15 cases in hospital. The total number of out-patients treated was 44,623 as against 33,089 for last year: of these only 493 were new cases, the rest being repetitions. A proportion of malignancy is always present.

There were 12 cases of assault among offenders with instruments, but none of them were serious.

The principal diseases treated were influenza, nasal catarrh, diarrhœa, skin disease and bronchitis.

There were two deaths during the year, one from pulmonary tuberculosis, the other an aged offender who died in his sleep of coronary thrombosis.

The number of operations performed was 34 of which 2 were major as against 56 for the previous year.

The number of dental extractions, fillings, etc., performed was 238. Dentures was supplied to 7 offenders and spectacles to 8 offenders.

The Medical Officer reported as follows on the diet:—

> Every day the rations supplied by the Contractors are inspected by the Medical Officer or the Hospital Assistant. Any article under standard is rejected. The diet is ample and very nutritious and no nutritional or vitamin deficiency disease was detected. Such diet extras as eggs, butter and milk are supplied to the sick and especially to tuberculosis patients.

POLICE HOSPITAL

A total number of 560 in-patients were treated in the Police Hospital as compared with 471 in the previous year. Total attendances at out-patient clinics were as follows:—

——	New Cases	Repetitions	Total Attendances
Hill Street, Families Clinic ...	1,651	9,563	11,214
Police Training School ...	3,025	6,123	9,148
Total ...	4,676	15,686	20,362

There were 85 police wives confined in barracks compared with 31 in 1951.

During the year 2,066 children were inoculated against diphtheria, and 4,673 women and children were vaccinated against small-pox.

It will be noted that while the Medical Officer, Police, looks after the Police Hospital and all men of the rank and file, the Lady Medical Officer, Police, is concerned with all Police families of the rank and file.

The inhabitants of Jurong and Tuas are now supplied with pipe-water, a great boon which is much appreciated.

GOVERNMENT MEDICAL STORE

The Government Medical Store organization with its pharmaceutical manufacturing section operated in 1952 for the first time as a complete unit in the new premises which have been designed and built for this division as one of the first stages of the Medical Plan. The second half of the building programme, the block of laboratories and offices, was completed and handed over for occupation in February. The old Mission Hospital building in Maxwell Road was retained by the Medical Department as a reserve store for 'emergency' medical stores and equipment under the Medical Civil Defence scheme, and the rooms in the General Hospital temporarily occupied by the Government Medical Store manufacturing section were converted to consulting and waiting rooms for the Medical Officer responsible for junior Government officials.

Layout of Premises

The site of the new buildings is on part of the pre-war Sepoy Lines Golf Course, adjacent to the General Hospital. The completed project comprises the following:—

(*a*) detailed issues godown—a completely shelved godown from which all hospital supplies are sent out;

(*b*) bulk stores godown—from which collections from the Singapore Harbour Board, shipping documentation, transportation, and disposal of bulk stores are arranged;

(*c*) inflammables store—for acids, dangerous goods, and inflammables of which the two main items are alcohol and ether;

(*d*) block of four garages and carpenter's and mechanic's workshops, with four drivers' quarters on the upper floor;

(*e*) main block with four offices on the first floor and pharmaceutical laboratories on both ground and first floors. Also on the ground floor is an air-conditioned store for rubber articles and certain pharmaceuticals liable to rapid deterioration, and a cold room for reserve stocks of sera and vaccines.

Store Organization

Running this stores and manufacturing section as one unit in proper premises designed for the purpose has proved very successful and economical. The stores side turned over twice as much stock as was being handled a short time ago and the number of staff employed is smaller as a result of proper storage space and well arranged stocks. In 1949 the senior staff employed in the shipping, receipt, and issues of stores consisted of 9 hospital assistants and 1 clerk; today 4 hospital assistants, 2 junior storekeepers and 1 clerk are handling far more stores without difficulty. The hospital assistants were released for other duties. There is no backlog of orders and a record number

of 4,542 requisition or invoice forms were made up for supplies to the various hospitals, clinics, out-patients dispensaries, etc. and were issued promptly throughout the year. Arrangements to supply a number of non-Government organizations, the University of Malaya, S.A.T.A., and several charitable institutions were continued, and dangerous drugs were supplied to pharmacies and medical practitioners.

The number of items carried in store as standard stock rose during the year to just over 5,000. In addition there are some 2,000 items of non-standard stocks. A proof was prepared for a bound catalogue of all standard stock items, divided into the various sections and giving current prices (net landed costs); this will be published by the Government Printer shortly and copies will be distributed in the first few weeks of 1953 to all departments supplied with stores.

A comprehensive Board of Survey and a complete stock check of drugs and chemicals was carried out early in the year, an officer of the Department of Statistics being in charge of the survey team. There were very few discrepancies in the stock. A separate Board was convened at the end of the year and commenced a survey of the surgical section.

Purchasing Arrangements and Supplies

The bulk-buying arrangements through the Crown Agents for the Colonies has worked very smoothly and there were no troubles over shipment. The Crown Agents put our orders out to tender promptly and in most cases the stores were shipped without delay. The number of crates, packing cases, etc. received was, as anticipated, much greater than previously, reaching 5,500 in all against 3,700 in 1951. Postal packets received numbered 800 and several urgent requirements were obtained by G.P.O. air-parcels service. There were 68 claims on the shippers for losses or deficiencies, but these were practically all breakages in transit or minor short-packings. The division still employs only three vehicles but these are extremely busy as a result of increased turnover.

The purchase of X-ray films and medical gases continued on contract locally and there was an appreciable amount of local purchasing. On account of extremely keen competition two orders for dihydrostreptomycin and procain penicillin were put out to tender between the local branches or agents of the principal antibiotic manufacturers. The orders were thus placed at much lower prices than were offered to the Crown Agents for the Colonies, and a saving of several thousand dollars was effected. Morphine Hydrochloride and Codeine Phosphate were purchased from the Government of India Opium Factory at Ghazipur, U.P. and alcohol and ether were purchased direct from Australian manufacturers for shipment from Sydney; in all cases resulting in considerable saving, the latter two partly on account of lower freight charges.

No drugs were imported from the U.S.A. or other hard currency areas. Aureomycin, previously imported from New York, is now available from the suppliers' factory in the United Kingdom.

The total value of stores issued to all hospitals, clinics, outdoor dispensaries, welfare centres, etc., for the year was $1,450,000 an increase of 23 per cent over the 1951 figure. Of this sum about two-thirds represents pharmaceuticals, drugs and chemicals, and the balance surgical supplies and equipment, hospital linen, uniform materials, etc.

One wonders how the budget for pharmaceuticals and drugs was made up before the last war since half of the money expended nowadays is on new

drugs not heard of then. The following table shows the issues of antibiotics, etc., and the value of the total quantities used in all medical establishments during the year.

——	1st Qr. Jan.–March	2nd Qr. April–June	3rd Qr. July–Sept.	4th Qr. Oct.–Dec.	Total used in 1952	Annual Value
						$
Penicillin (in Mega Units) ..	17,400	22,400	21,800	24,600	86,200	99,300
Procain Penicillin (in Mega Units)	12,100	14,400	13,300	18,200	58,000	76,100
Dihydrostreptomycin (In grm.)	18,800	15,600	32,000	25,500	91,900	88,900
Aureomycin 0.25 grm. Capsules	6,600	13,300	12,300	12,300	44,500	34,200
Chloramphenicol 0.25 grm. Capsules	12,600	7,400	4,300	3,400	27,700	22,400
Terramycin 0.25 grm. Capsules	1,600	1,300	1,300	3,200	7,400	7,200
Cortisone 500 mgm. in 20 Ml vial	24	117	180	230	551	16,500
Sod. para amino Salicylate Tablets 0.5 grm.	895,000	636,000	294,000	955,000	2,780,000	29,000
Sulphathiazole and other Sulpha Tablets 0.5 grm. ..	185,000	251,100	357,700	261,100	1,055,300	26,000
Vitamins—Aneurin, Riboflavin, Niacin, Ascorbic Acid, etc.						28,500
Total Value ..						428,100

Staff

A second pharmaceutical chemist, Mr. J. S. Robertson, PH.C., joined the department in June and the staffing position is now eased. It will now be possible to do much more work in improving the quantity and quality of laboratory products, as the one pharmaceutical chemist was previously very much tied down in running stores and laboratories and in administration work.

Three hospital assistants were transferred to hospitals without replacement as a result of the improved facilities and the menial staff re-allocated. The present staff is 66 distributed as follows:—

Pharmaceutical Chemists (2)

Stores—(29)	Office—(13)	Laboratory—(22)
4 Hospital Assistants	1 Financial Assistant	1 Pharmacist
2 Storekeepers	1 Hospital Assistant	3 Laboratory Assistants
1 Clerk	1 Stenographer	3 Probationer Laboratory Assistants
1 Carpenter	1 Storekeeper	1 Mechanic
3 Drivers	8 Clerks	14 Packers
4 Watchmen	1 Office Boy	
14 Packers		

The artisans are both employed in the store and laboratory although the carpenter is shown on the store staff and the mechanic under the laboratory. Considerable difficulty was experienced in recruiting probationer storekeepers, and two of these posts remained vacant at the end of the year.

Civil Defence Reserve Stores

The Stores Officer for Civil Defence stocks has not been shown in the above scheme as this is to be a more or less separate organization next year.

In addition to this officer only one clerk/typist and three packers were employed as extra staff for dealing with the reserved stocks. With additional purchases next year for equipping hospital units the staff for this side is to be increased.

Further purchases of civil defence stocks were made and a large indent was sent to the Crown Agents for the Colonies later in the year. This equipment is now purchased from a Special Expenditure vote and not the Unallocated Stores Account which is the purchasing account for normal hospital supplies. Earlier in the year the position regarding reserves of bedding for Civil Defence was improved by purchases from the military authorities of several tons of used mattresses, cushions and pillows, bought for remaking into hospital bedding at the Changi Prison workshop. Ten thousand pairs of unused patients' pyjamas were also supplied by the Army. The co-operation of the Army, Air Force, and H.M. Naval Base Authorities in helping us build up these reserves is greatly appreciated.

Laboratory Production

In the new pharmaceutical laboratories, occupied in February, a record output of pharmaceuticals was produced. It has been a great struggle to keep departments supplied during the past three years using makeshift facilities. Particularly was this so over supplies of ampoules, multidose injection vials and transfusion salines, which had been packed in borrowed premises at the General Hospital under very unsuitable conditions. The new injection preparation department this year produced half as much again as in previous years, and a wide variety of injections were made. A record of the ampoules and multidose injection vials prepared is attached. This only represents part of the output as large quantities of normal saline, dextrose solution and other transfusion fluids, also hundreds of penicillin-sulphanilamide pessaries, quantities of penicillin ointment, various eye ointments, and other sterile products were packed by this section which is now under the supervision of a pharmacist.

The injection preparation department is the only part of the laboratories on the upper floor of the new block, apart from a small room equipped with a fume cupboard and facilities for analytical and experimental work. The other manufacturing rooms occupy the ground floor of the building and the output here was also greatly increased. The new steam plant with heating pans, stills, and autoclaves proved very useful and both easy and economical to operate. The tablet machine was running practically constantly day in and day out in order to cope with the huge demand for vitamin tablets, iron tablets and all the other tablets which are dispensed in such large numbers each month. The second machine had not arrived by the end of the year but was expected in January.

Equipment which has lain idle for some years due to there being no premises to run it in was utilized fully in this new organization. This includes a Gardner sifter-mixer, homogeniser, and drug mill which were awaiting installation.

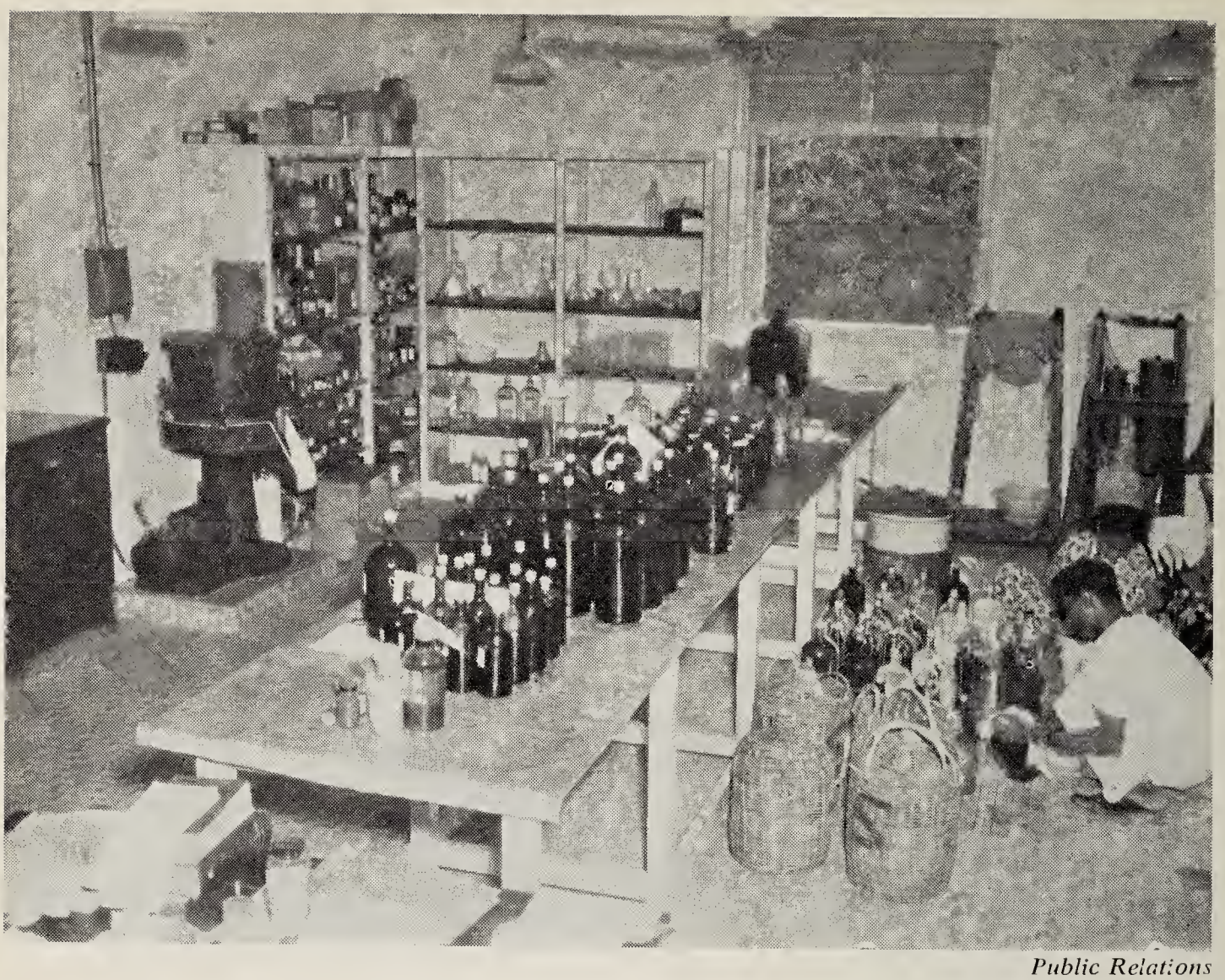
The 'wets' laboratory turned out large quantities of galenicals, and both in this section and the injection department several new preparations were made from raw materials for the first time, including stilbœstrol tablets and injections, propamidene and chloroxylenol creams, concentrated infusion of buchu, aminophylline tablets, and vitamin B12 preparations. A purchase of locally grown Ipecacuanha root was made and approximately six thousand dollars worth of this drug was powdered and percolated to prepare a batch of Tincture of Ipecacuanha. The job took some time as the percolators available are not very large but this difficulty is being remedied as the P.W.D.

Public Relations

A part of the Leprosy Settlement

Public Relations

Children at the Leprosy Settlement



Public Relations

A part of the Manufacturing Section of the Government Medical Store

Public Relations

Diversional Therapy for Tuberculosis Patients

workshops are constructing a much larger copper percolator. Some three hundred pounds of Tincture of Opium B.P. in 1 lb. and 5 lb. packings were also prepared for supplies to both Government establishments and private pharmacies.

Every year brings a new drug, one of the 1952 new preparations being isonicotinyl hydrazide. The department has commenced to tablet it from raw material in batches of 100,000 tablets for the Tan Tock Seng Tuberculosis Clinic and S.A.T.A. Some experimental work was done in improvement of formulæ. For instance a standard liquid soap of maximum soap content for the liquid state was prepared from coconut oil and used with success in various products such as lysol, chloroxylenol solution, turpentine liniment, etc.; it is the cheapest form of soap and excellent in use. The quarterly figures for the principal items prepared are given at the end of the report; the number of works orders completed was 1,766 against 1,300 in 1951.

Some idea of the increase in the work of this pharmaceutical manufacturing section may be obtained from the annual figures for consumption of Aneurine Hydrochloride (Vitamin B1):—

	Kilogrammes
1947	0.3
1948	1.2
1949	3.1
1950	14.8
1951	16.3
1952	23.0

Vitamin B1 is a drug for which there must be a steady demand in Malaya as there are always deficiency cases requiring treatment, and it is probably more typical of a bread-and-butter line in the department than any other. The quantities given above are for the raw material, Aneurin, which is all used in the pharmaceutical laboratory in preparing Vitamin B1 injections and B1 and multi-vitamin tablets. They indicate the extent to which the issuing of Aneurin preparations from dispensaries and clinics has increased with extended medical services, and also of the extent to which this manufacturing section has had to step up production in order to cope with the demand. In 1948 5 kilos of Aneurin were purchased at a reduced price of $537 per kilo from an Australian manufacturing firm which was closing down; it was considered at the time a large purchase and the stock was expected to last 2 or 3 years. Little was it realized that only 4 years ahead this quantity would be used up every 2 or 3 months.

Laboratory Costs

The saving to Government in having a pharmaceutical manufacturing laboratory as part of the store organization may not be fully appreciated. Pharmaceutical products when prepared in the laboratory are generally far cheaper than the corresponding proprietary pack, in some cases a half or one third of the landed cost of imported supplies. The saving varies considerably: it is not worth while making quite a number of tablets or certain galenicals, and these are therefore bought from large-scale manufacturers through the Crown Agents. In 1952 the value of drugs, etc., converted into manufactured products was $176,400; it is difficult to assess what these pharmaceuticals would have cost if imported as proprietary packs, probably between $300,000 and $400,000. To assess the actual saving the following annual overheads must be added to the figure for raw materials given above.

	$
Staff salaries (gross including all allowances)	45,000
Water, light, electricity, etc.	5,000
Laboratory maintenance vote	3,500
Total ...	53,500

The figure for staff salaries for the year is made up of $28,000 for the pharmacist and laboratory assistants and $17,000 for the 14 packers.

It will be seen that the figure in the estimates for maintenance of the pharmaceutical laboratory, $3,500, is very small in comparison with the value of the goods produced; and allowing for all overheads the saving effected by this section will pay for the cost of construction of the new premises and the extra laboratory equipment within two years. If output continues to increase a saving of about $1 million will be effected in the next five years.

Superintending Pharmaceutical Chemist: Mr. D. E. Lovett, B.PHARM. (London), PH.C.

STATISTICS

STORES AND SHIPPING

		$	c.
A.	(*a*) Number of packages received—(i) per freight ...		5,494
	(ii) per post ...		801
	(*b*) Number of Bills of Lading		774
	(*c*) Number of packages despatched—(i) per sea ...		13
	(ii) per rail ...		36
	(iii) per post ...		27
	(*d*) Transport mileage—22,131 miles		
	(*e*) Number of Crown Agents Claims—68		
	(*f*) Number of requisitions or invoices—4,542		
	(*g*) Number of items in stock—5,056		
	(*h*) Value of stores written off—$32,043.99		
	(*i*) Value of Stock at 31st December—$1,837,911.90		

FINANCE

B.	*Unallocated Stores:*		
	(*a*) Value of orders placed on Crown Agents ...	1,037,595	59
	(*b*) Value of stores purchased locally	327,941	30
	(*c*) Value of stores purchased from other countries—		
	India	21,123	74
	Italy	17,450	87
	Australia	10,789	27
	Recoveries:		
	(*d*) Total cost of stores billed	1,448,831	10
	(*e*) Total bills outstanding	40,350	11
	(*f*) Commission 10%	1,606	89
	(*g*) Amounts paid (i) U.S. Recoveries	1,384,943	75
	(ii) Revenue	38,522	21

LABORATORY

C.	(*a*) Number of works tickets completed—1,766		
	(*b*) Value of Drugs, etc. converted into manufactured products	176,412	10
	(*c*) Quarterly production of main items:—		

———	1st Qr. January–March	2nd Qr. April–June	3rd Qr. July–September	4th Qr. October–December	Total 1952
Mixtures (in gallons) ..	774	830	780	778	3,162
Linctus and Syrups (in lb.) ..	3,762	3,284	3,453	5,315	15,814
Lotions (in gallons) ..	231	370	40	42	683
Emulsions (in lb.) ..	560	716	703	889	2,868
Tinctures, Infusions and Extracts (in lb.)	1,700	2,984	1,671	1,498	7,853
Ampoules	12,630	10,019	12,724	8,258	43,631
Multidose Injection Vials (15 or 20 Ml.)	7,872	5,974	7,865	6,505	38,216
Transfusion Salines (540 Ml. bottle)	1,284	3,248	1,802	2,003	8,337
Tablets	323,000	1,596,000	2,265,000	2,524,000	6,708,000

GOVERNMENT MEDICAL STORE

INJECTION ROOM PRODUCTION OF AMPOULES AND MULTIDOSE VIALS—1952

——	1st Qr. Jan.–March	2nd Qr. April–June	3rd Qr. July–Sept.	4th Qr. Oct.–Dec.	Total for year
Acid Ascorbic 100 mgm/ml. .. 15 ml. vial	64	216	229	299	808
Adrenalin Inj. B.P. .. 30 ml. vial	58	296	..	136	490
Aminophylline 0.5 grm. 2 ml. amp.	907	478	1,136	..	2,521
Aneurin Hyd. 10 mgm/ml. .. 20 ml. vial	..	..	332	54	386
Aneurin Hyd. 50 mgm/ml. .. 20 ml. vial	..	..	536	380	916
Aneurin Hyd. 100 mgm/ml. .. 15 ml. vial	876	..	361	378	1,615
Aneurin Hyd. 200 mgm/ml. .. 15 ml. vial	..	..	105	..	105
Aqua Dest. .. .. 30 ml. vial	669	2,418	1,841	1,817	6,745
Atropine Sulph. 1/100 gr. 1 ml. amp.	..	..	..	102	102
Atropine Sulp. 1/100 gr. ml. .. 15 ml. vial	67	97	197	158	519
Carbachol 25 mgm. 1 ml. .. amp.	..	..	1,013	..	1,013
Calc Gluconate 10% 10 ml. amp.	1,813	2,233	3,080	520	7,646
Cinchocain Hyd. 20 ml. .. amp.	208	241	210	129	788
Cinchocain 2% .. .. 30 ml. vial	..	..	180	..	180
Cocain Hyd. 10% 2 ml. .. amp.	1,905	..	116	201	2,222
Cocain Hyd. 10% .. 50 ml. vial	..	..	5	..	5
Dapsone 20% .. .. 20 ml. vial	248	716	818	..	1,782
Dapsone 20% .. .. 50 ml. vial	..	..	180	..	180
Diamorphine Hyd. 1/12 gr. 1 ml. amp.	..	..	12	..	12
Diamorphine Hyd. et Atrophine 15 ml. vial	4	..	..	3	7
Digoxin 0.5 mgm. 1 ml. .. amp.	..	..	..	185	185
Dextrose 50% .. .. 20 ml. vial	..	..	96	272	368
D.O.C.A. 10 mgm. 1 ml. .. amp.	..	..	300	..	300
D.O.C.A. 10 mgm. .. 15 ml. vial	..	58	182	..	240
Emetine Hyd. 1 gr. 1 ml. .. amp.	..	404	425	..	829
Ergometrine Maleate 0.5 mgm. 1 ml. amp.	1,817	47	1,788	3,914	7,566
Ergometrine Maleate 25 mgm./ml. .. .. .. 15 ml. vial	..	..	698	282	980
Heparin 1,000 Unit/ml. .. 5 ml. vial	59	59	98	137	353
Histamine Acid Phosph. 1 mgm. 1 ml. amp.	..	..	..	45	45
Hyoscine Hydrobrom. 1/100 gr. 1 ml. amp.	..	..	673	..	673
Hyoscine Hydrobrom. 1/150 gr. 1 ml. .. .. 15 ml. vial	75	..	..	70	145
Lobeline Hyd. 3 mgm. 1 ml. .. amp.	587	1,367	..	..	1,954
Menaphthone 10 mgm./ml. .. 15 ml. vial	191	..	230	..	421
Mersalyl 0.2 grm. 2 ml. .. amp.	1,357	1,357	1,962	..	4,676
Morphine Hyd. 1/6 gr. 1 ml. .. 15 ml. vial	..	40	..	59	99
Morphine Hyd. 1/4 gr. 1 ml. .. amp.	24	..	..	..	24
Morphine Hyd. 1/4 gr. 1 ml. .. 20 ml. vial	170	..	85	178	433
Normal Saline .. .. 20 ml. vial	48	..	..	..	48
Paraldehyde 5 ml. .. amp.	177	177	341	178	873
Papaveretum 1/3 gr./ml. .. 15 ml. vial	..	290	160	150	600
Papaverin Hyd. 40 mgm. in 20 ml. 20 ml. vial	..	..	..	6	6
P.B.S.C. 3 ml. .. .. 3 ml. vial	5	..	..	..	5
Pethidine Hyd. 100 mgm. 2 ml. amp.	490	..	..	..	490
Pethidine Hyd. 50 mgm./ml. .. 20 ml. vial	381	383	494	296	1,554
Phenobarbitone Sod. 3 gr. .. vial	1,707	563	583	432	3,285
Phenol 5% in Olive Oil .. 20 ml. vial	..	..	17	..	17
Procain Hyd. et Adrenalin 2 ml. amp.	..	..	..	119	119
Procain Hyd. 2% .. .. 30 ml. vial	1,352	1,862	742	598	4,554
Procain Hyd. 2% .. .. 120 ml. vial	..	..	107	88	195
Carried forward ..	15,259	13,302	19,332	11,186	59,079

GOVERNMENT MEDICAL STORE

INJECTION ROOM PRODUCTION OF AMPOULES AND MULTIDOSE VIALS—1952—*contd.*

	1st Qr. Jan.–March	2nd Qr. April–June	3rd Qr. July–Sept.	4th Qr. Oct.–Dec.	Total for year
Brought forward ..	15,259	13,302	19,332	11,186	59,079
Proctocain 5 ml. .. .. amp.	..	127	..	187	314
Pyridoxine Hyd. 50 mgm. 2 ml. amp.	469	905	..	..	1,374
Pyridoxine Hyd. 50 mgm. 15 ml. 15 ml. vial	..	..	196	..	196
Nikethamide 25% 2 ml. .. amp.	1,905	1,412	..	1,982	5,299
Riboflavine 1 mgm. 2 ml. .. amp.	..	..	..	325	325
Ringer Lactate Soln. 120 ml. .. 120 ml. vial	..	..	..	8	8
Sod. Bicarb. 5% .. .. 20 ml. vial	..	23	..	..	23
Sod. Thiosulph. 10% 10 ml. .. amp.	191	258	187	371	1,007
Sulphetrone 60% 1 ml. .. amp.	780	427	..	..	1,207
Sulphetrone 50% 20 ml. .. 20 ml. vial	730	490	591	977	2,788
Stibophen 15 ml. .. .. 15 ml. vial	128	193	400	193	914
Testosterone Prop. 10 mgm. 1 ml. amp.	..	..	502	..	502
Vitamin B12 20 mcg. 1 ml. .. amp.	..	..	979	..	979
Vitamin B12 20 mcg/ml. .. 15 ml. vial	..	..	492	570	1,062
Total production for each Quarter ..	19,462	17,137	22,679	15,799	75,077

CIVIL MEDICAL DEFENCE

In the Report on Civil Medical Defence for 1951 details were given of the 'Casualty Service' plan in the United Kingdom, and attention was drawn to the fact that the United Kingdom plan could not be adopted *in toto* locally.

In actual planning since then, however, the United Kingdom scheme has been fairly closely followed. The Civil Medical Defence Plan, which has been approved in principle by Government, calls for the formation of a Casualty Hospital Service, the provision of First Aid Services, and the expansion of essential Ancillary Services.

The Casualty Hospital Service will be organized in Casualty Hospital Units of 450 beds; each Casualty Hospital Unit will comprise three sections (either surgical or medical) of 150-beds in three 50-bedded wards. These Hospital Units will be responsible for receiving and treating casualties and for treating acutely ill who require hospitalisation. As part of the plan it will be necessary to improvise hospitals to accommodate some of the Casualty Hospital Units and sites have been tentatively selected.

The First Aid Services will consist of 20 Static First Aid Posts and 30 Mobile First Aid Units. The Static First Aid Posts will give immediate treatment to casualties, the more seriously injured being sent to a Casualty Hospital Unit. Certain of these Static First Aid Posts will have additional equipment and staff so as to treat the ordinary sick and possibly maternity cases. Only the acutely ill will be moved to hospital. The Mobile First Aid Units will be attached to Hospitals and to certain of the Static First Aid Posts. Mobile First Aid Units will move out as required and establish First Aid Posts at a convenient site as near as possible to the scene of an incident. The Static First Aid Posts will in the main be sited in existing clinics and hospitals and sites have been tentatively selected. There will, in addition, be a Hospital for Chronic Cases on St. John's Island and it is intended to establish 1,000 beds in Convalescent Depots in order to ease, as far as may be possible, the strain on the Casualty Hospital Units.

The organization of the X-ray, Laboratory and other Ancillary Services so as to provide these technical facilities for the Casualty Services is also planned. Static X-ray and Bacteriological Laboratory Units will be established in existing hospitals while independent Mobile Units will be available to service outlying Casualty Hospitals or other Units.

One Service in particular which will be of the utmost importance is the Blood Transfusion Service. Blood Transfusion Therapy is now an integral part in hospital treatment and the requirements in an Emergency will be considerably greater than at present. A large scale expansion of this Essential Service has been planned but very many more blood donors will be needed.

Scales have been worked out for staff, medical stores and equipment for each of the Services and it is intended to build up the Hospital and other Units gradually. In addition to the peace-time Hospital Services it is anticipated that medical stores and equipment for four Casualty Hospital Units, all the Static First Aid Posts and Mobile First Aid Units will be available by the end of 1953. Provision has also been made for the purchase of equipment for certain of the Ancillary Services.

The manning of the expanded Medical Services will be of the utmost importance and, as pointed out in the Report for last year, any expansion of the hospital services to deal with casualties is limited by the available medical manpower quite apart from problems of accommodation and equipment.

Singapore Hospital Reserve

To man the expanded services the formation of a Singapore Reserve has been approved and the 'Civil Defence—Singapore Hospital Reserve—Formation Rules' were published as *Gazette* Notification No. S 325 and subsequently accepted by the Legislative Council. Members will be used in an Emergency to augment the permanent staff of the Medical Department. The Reserve, in which service in peacetime is on a voluntary basis, will consist of several Sections; Medical Practitioners, Trained Nurses, Nursing Auxiliaries, Technicians and General Duties personnel. Service will be on the 'Active List', 'Deferred List' or 'Supplementary List'.

Members on enrolment will be placed on one of the above 'Lists' and posted to an appropriate Section of the Reserve. Training for Medical Practitioners, Trained Nurses and Technicians will be such as will enable their services to be utilised in the Civil Medical Defence Plan to the best advantage. Nursing Auxiliaries will be required to hold the First Aid and Home Nursing Certificates of the St. John Ambulance Association or the British Red Cross Society. Subsequently training will be carried out in the wards of the General Hospital. Each recruit will be required to carry out 80 hours' hospital training but exemption may be given in respect to previous training in the wards. It

is intended that Nursing Auxiliaries who are prepared to undergo additional hospital training will spend periods of training in the surgical theatres, casualty room and in hospital administration. General Duties personnel are required for administrative clerical duties, as ward orderlies, stretcher bearers, transport drivers, etc. Training of General Duties personnel will be such as to fit them for the actual duties they will be required to carry out and priority will be given to training in administrative and steward duties.

As training is completed members will be posted to a Casualty Hospital Unit, Static First Aid Post, Mobile First Aid Unit or to one of the Ancillary Services. Subsequently they may be called upon to either attend refresher courses or to take part in exercises in conjunction with other branches of the Civil Defence Services, but such training will in no case exceed 48 hours in any one year.

Recruiting for the Reserve opened before the end of the year but the response has been disappointing. Enquiries among members of the Voluntary Organizations indicate that there is a certain unwillingness to undertake additional commitments, more particularly if such may interfere with voluntary work already being carried out. The main concern, however, is in respect to the 'Terms and Conditions of Service', either part time or full time, in an Emergency, and also the question of 'Civil Liability' in the event of injury or death. Nevertheless work has started on all the above organizations and 1953 should see all the units taking proper shape.

Medical Stores and Equipment

When the Government Medical Stores moved to the new premises at Silat Road the store at Maxwell Road was made available as an Emergency Medical Store, and segregation of stores required under the Civil Medical Defence Plan is now being carried out. It may be noted that the stores and equipment bought under the $1,000,000 Stockpile Vote represented in the main six months normal hospital requirements and therefore are not directly related to the requirements under the Scales of Medical Stores and Equipment which have since been laid down as mentioned above for Casualty Hospital and other Units. Expendable items such as drugs are held at the Government Medical Store at Silat Road so as to permit turnover while some other items have been issued on loan to prevent deterioration.

Towards the end of the year further stores and equipment were ordered from the United Kingdom payable out of the balance of the $1,000,000 Stockpile Vote.

At the end of the year information was received that a store for medical equipment would be made available within the perimeter at the Civil Defence Corps Headquarters, Kolam Ayer Lane.

Assistant Director of Medical Services (Civil Defence): Dr. W. E. Hutchinson, M.A., M.D., D.P.H., E.D. J.P.

APPENDICES

APPENDIX *I*

REPORT OF A SELECT COMMITTEE OF THE LEGISLATIVE COUNCIL ON THE MEDICAL PLAN FOR SINGAPORE

Note:—The figures given in the Appendices to this Select Committee's Report bear no relation to present building costs which have considerably increased over the period. In addition the Plan which had been modified by limiting the growth of the General and Kandang Kerbau Hospitals to 800 and 350 beds respectively with further expansion on a new site has been finalised recently by increasing the former to 1,350. The Bedok site being no longer available for the Sanatorium this expansion is planned elsewhere. Teaching requirements and quarters for housemen and post graduate resident staff are receiving full consideration in this planning. This is particularly the case at Kandang Kerbau. At the time this report was finalised in 1953 the Medical Plan was proceeding apace and especially so at Kandang Kerbau and the General Hospital. The modification of the Plan in regard to the Rural Area is explained in the text of the main Report.

1. At a meeting of the Legislative Council held on 18th May, 1948 a Select Committee consisting of the Acting Financial Secretary, Mr. M. J. Namazie, Mr. C. C. Tan, Mr. P. F. de Souza and Mr. Lim Yew Hock was appointed to examine and report to the Legislative Council on 'The Singapore Medical Plan' prepared by Dr. W. J. Vickers, Director of Medical Services, Singapore, and set out in Council Paper No. 4 of 1948.

2. It is observed that the Plan was first placed before the Advisory Council as Council Paper No. 12 of 1947. In this Plan a total capital expenditure of $51,082,000 was envisaged over a period of five years. Additional items amounting to $7,736,000 were marked for consideration if possible. The date of this Plan is 11th February, 1947. It was necessary to review this Plan for two reasons; firstly, the impossibility of providing funds on such a scale over so short a period, and, secondly, the incapacity of the Public Works Department of the Colony to undertake so vast a task in addition to its normal works. In consequence, the Director of Medical Services, with the assistance of a Committee consisting of the Principal of the College of Medicine, the Chief Health Officer, the Chief Medical Officer, the Professor of Surgery, the Professor of Midwifery, Dr. Haridas and Dr. Nicholas, suggested some modifications to the original Plan in February 1948. The original Plan, together with the modifications recommended by that Committee and a note by the Director of Medical Services on how the Plan arose, are all contained in the Council Paper first mentioned, namely, Legislative Council Paper No. 4 of 1948. The actual details of the Plan, arranged as a Ten-year Plan and as a Fifteen-year Plan, are shown in the Schedule on pages 26 and 27 of the Paper.

3. The Committee held meetings on the 7th and 17th of June, the 8th, 22nd and 30th of July, on the 12th August and on 8th September, 1948. The Director of Medical Services (Dr. Vickers) attended the meetings throughout and assisted us greatly with explanations and advice. The Director of Public Works (Mr. Kirk) and the Government Architect (Mr. Cuthbertson, and, later, Mr. Brundle), also attended most of our discussions and provided us at very short notice with numerous sketch-plans and figures; and the Committee wishes to acknowledge with gratitude the very valuable assistance given to us by these Officers. The Committee also paid a visit to the General Hospital and saw every aspect of the work there. This was most valuable to us not only for the practical view it enabled us to take of the particular problems there but also for the knowledge which it enabled us to apply to the consideration of other aspects of the Medical Plan generally. In addition, two members made a special visit to the Venereal Diseases Hospital, and the Chairman was able to give Members first-hand information gained by him in extensive inspection of the Leper Settlement, the Quarantine Station at St. John's Island and the Tan Tock Seng Hospital.

4. The Committee desires to state at once that the Medical Plan is one which, in our opinion, should, subject to the comments and modifications set out in this Report, be accepted. In this connection we wish to emphasise that we decided not to concern ourselves with the question to what extent the Colony can afford to execute this Plan. That is a question which it will be possible to answer only when all the other calls

likely to fall upon the Colony during the next few years are known. There are many items in view—the University, Housing, Education and Social Welfare, Changi Air Port, etc.—which will make formidable demands upon the finances of the Colony. It will be necessary for all of them to be fitted into the picture before it can be seen in proper perspective. As regards the Medical Plan, the problem to us took the form of a simple question—Does Singapore need this Plan? And our answer to the question is 'Yes'. We agree with the opinion of the substantive Financial Secretary (Mr. J. D. M. Smith) as expressed in a Minute he wrote on the 29th December, 1947. In that Minute he stated:—

> '.....I think that the correct approach to the Plan as a whole is first to discuss medical policy as such and on its merits, without intruding the financial aspect. It is obvious that the Colony can never spend on medical services any more than it can afford to spend at any time on medical services. Therefore, once the main lines of medical policy are settled, the Colony then spends along those lines what it can afford to spend. And the breadth of those main lines of policy, in relation to the lines of policy in other fields, will determine the ratio of expenditure on medical services. The first step, therefore, is examination of the Plan on its merits as a statement of medical policy in the Colony.....'

In stating our agreement with these views, we do not, of course, mean to infer that the amount which the Colony can afford to spend on medical (or for that matter other) services is necessarily to be governed by present revenue figures. It may be necessary, and probably will be necessary, to find additional funds to carry out this and other Plans. Some of this may have to be by additional revenue; some from loans. What we mean is that we have considered this Plan independently of financial considerations; we think that we should the better discharge the duties laid upon us by trying to arrive at conclusions as to whether the Plan is in itself a desirable plan of medical policy. The case for the Plan is fully and ably set out in the Council Paper, and we have no intention of trying to add further reasons to those already given. We consider that it is a desirable Plan, and not only desirable but necessary if the Government is to meet its obligations to the people of the Colony.

5. We should like at the outset to refer to one matter which intruded itself upon all our discussions. It is the question of quarters. It was quite clear to us that the question of the provision of quarters for the institutional staff of the Medical Department is one upon which most of the others depend. Until considerably more accommodation is available, extensions and improvements in other directions will be of no avail. The Committee which assisted Dr. Vickers have dealt with this aspect of the problem in paragraph 5 of their Report (Annexure *B* to the Plan). They say:—

> 'Until more staff accommodation has been provided further recruitment and expansion is out of the question. The Committee wishes to bring this fact forcibly to the attention of Government: proper and up-to-date quarters for existing staff is first priority, and must take priority over further hospital expansion.'

We have made a close examination of this aspect of the Plan and have no hesitation in supporting the above opinion. We gather that the housing position of Government servants generally is unsatisfactory. Nevertheless we consider that the problem of accommodating hospital staffs takes priority over any general scheme. We consider, therefore, that medical quarters should be regarded not only as a part of the Medical Plan, but as its most urgent part.

In connection with the question of quarters, the Committee is unanimously of the opinion that a better type of quarters for the lower grades of hospital workers should be provided. We feel strongly that the building of the one-room type of quarters should be discontinued and that quarters with two rooms of somewhat smaller size should be provided in future.

6. We now deal with the individual items shown in the Schedule to the Plan:—

1. BASE MEDICAL STORE, PHARMACY SCHOOL AND ESSENTIAL MANUFACTORY

The purpose of this Store is to safeguard medical stores which arrive in the Colony, to make possible the local manufacture of expensive drugs with an ultimate saving to Government by so doing, and to concentrate the storage and manufacture at one point. We inspected the plans and the proposed site for this Store and approve them. We recommend that this item be included in the Plan. Further investigation has revealed that the building can be built and equipped for about $450,000, which gives a probable saving of $250,000 on the estimate shown in the Schedule to the Plan.

2. LEPER SETTLEMENT

The Committee is in entire agreement with the Director of Medical Services that the accommodation at the Leper Settlement is both inadequate and unsuitable. For these reasons, we consider that the amount of accommodation ought to be considerably increased and that the type of accommodation should be improved by progressively providing semi-detached quarters wherever desirable. Ancillary works in the form of roads, water supply and sewerage should also be provided. We investigated the estimates as far as it was possible for us to do so, and we agree that the estimate of $780,000 is a fair one. The Committee was informed that this item has been entered as one for allocation of funds from the Colonial Welfare and Development Fund, and that it should stand a good chance of being accepted as such. We consider, however, that it is a proper item to be included in the medical Plan and that, therefore, it should stay in the Plan, irrespective of where the funds come from with which to implement it.

In making the above recommendation, the Committee assumed that the necessary extensions and improvements will be carried out on the present site at Yio Chu Kang. At a late stage in our discussions, however, the Committee was asked to consider a suggestion to remove the Settlement from its present site to one of the neighbouring islands. As no alternative investigations on these lines had been made, and as no information is available as to whether a suitable site could be found or as to what the project would cost if such a site were available, the Committee considered it undesirable to delay this Report for such investigations to be made. Moreover, for various reasons, the Committee considered that the extensions and improvements should be carried out on the present site. In the absence of information, Mr. C. C. Tan wishes to reserve his opinion on this point.

3. GENERAL HOSPITAL

This is the largest and most important item in the Medical Plan, and we are completely satisfied that it is necessary. We visited the hospital and thoroughly examined the proposed improvements and extensions. In the original plan two General Hospitals were envisaged, each to take 1,000 beds. This was to be achieved by modernising the present hospital at a cost of $10,300,000 and by the building of a second hospital at a cost of $21,500,000.

The Committee which assisted the Director of Medical Services early this year, upon reviewing this part of the Plan, recommended that the present General Hospital should be extended to take 1,500 beds to overcome the delay involved in implementing the original scheme. This recommendation was incorporated in the schedule to the Plan as item No. 3 at an estimated cost of $16 millions, whilst a second item (No. 14) provided for one or two District Hospitals at a later date at an estimated cost of $11 millions. These were to provide a further 500 beds. The main lines upon which the extension of the General Hospital is proposed are:—the provision of quarters, a proper out-patient Department and Clinics, an up-to-date Children's Block and a satisfactory Pathological Block.

As stated above, the cost of the proposed improvements and extensions at the General Hospital is shown at $16 millions. We examined the estimates in detail and a breakdown of revised estimates is contained in Appendix *'A'* to this Report. It will be seen that two-thirds of the estimates of expenditure are accountable to the building of quarters. We most emphatically agree. We are pleased to report that further investigation has shown that a saving of approximately six millions can probably be effected on this part of the Plan, but we would emphasise that final estimates cannot be given with complete accuracy until the fullest investigations are made. We strongly recommend that this item should be proceeded with without any more delay than is necessitated by the capacity of the Public Works Department to do the work. We consider that it is the most urgent need, and that, if the work can be pushed on with quickly, the building of District Hospitals, which we shall deal with later, can wait.

The Committee agrees with the recommendation at the end of paragraph 8 of the Report of the Committee which assisted the Director of Medical Services (Annexure *B* to the Plan) that the bed ratios among the different classes of patients should be 80 1st Class, 200 2nd Class and 1,220 3rd Class.

4. KANDANG KERBAU MATERNITY HOSPITAL

The Committee is entirely satisfied with the proposals for the extension of this hospital. Here again, the main cost will be on account of quarters. A breakdown of the estimates is shown in Appendix *B* to this Report. A Schedule of proposed accommodation is shown in Appendix *C* from which it will be seen that the ward additions will give a bed ratio of 35, 77 and 410 as between Classes I, II and III excluding provision for labour rooms (1st Class 3 bed size; 2nd Class 6 bed size and 3rd Class 27 bed size) and isolation rooms (1st and 2nd Class, ten; 3rd Class 20 rooms).

5. RURAL CLINICS AND DISPENSARIES

The provision in this part of the Plan is for 16 clinics at $41,000 each and three dispensaries (with quarters for Hospital Assistants and Hospital Attendants) at $19,000 each. Thirteen of the Clinics will be established at the following places:—

Paya Lebar.
East Coast Road (8 mile).
Thomson Road.
Ulu Bedok.
Pulau Tekong.
Holland Road.
Pulau Bukom Kechil.
Sembawang.
Pasir Panjang.
Pulau Brani.
Tampenis (5 mile).
Jurong Road (17 mile).
Yio Chu Kang (6¼ mile).

We agree that the choice of the three remaining sites should be left over until more information is available as to how the needs of the population will develop. The dispensaries will be sited at Changi, Sembawang and Pasir Panjang.

The need for these Clinics is stated in paragraph 13 of the Medical Plan and is the subject of severe comment in paragraph 16 of the Report of the Committee which assisted the Director of Medical Services (Annexure *B* to the Plan). We are satisfied with the need for the proposals made and agree that the distribution proposed is suitable. Ancillary work will cost a further 10 per cent, making $784,000, a slight increase upon the estimate shown in the Plan.

Most of the expenditure for this item also, we were informed, has been entered for allocation under the Colonial Development and Welfare Fund, and the remarks we have already made in regard to the Leper Settlement apply to it.

6. ST. JOHN'S ISLAND WATER SUPPLY

We did not visit St. John's Island, but the Committee took note of the publicity that the Quarantine Station has received in the press and discussed the question at length in Committee. The problem of the water supply is a difficult one, and investigations are not yet completed. We consider, however, that the item is one that should be accepted. We were informed that it was hoped to receive an allocation covering the whole cost from Colonial Development and Welfare Fund and the remarks we have made in regard to the Leper Settlement and the Rural Clinics and Dispensaries apply to this item. Until such time as fuller investigations can be made and firmer estimates prepared, we recommend that the provision of $250,000 should stand in the Plan.

7. SCHOOL MEDICAL AND DENTAL CLINIC

The Committee discussed this item at some length, but the discussions turned mainly upon the site. We are entirely satisfied with the necessity for the provision of such a clinic, but consider that the closest attention should be paid to the choice of the most suitable site and that, if necessary, land should be purchased. The breakdown of figures for this work is as follows:—

	$
Building	122,000
Piling	24,000
Staff Nurse Quarters (3)	25,000
Hospital Assistant Quarters (1)	15,000
Hospital Servants' Quarters (2)	9,000
Ancillaries at 10 per cent	19,600

making in all approximately $215,000, a slight addition to the estimate as shown in the Plan.

The estimate for piling is, of course, based on the present site proposals, and if our recommendation for the investigation of a suitable alternative site is accepted, it is possible that the overall estimate can be reduced on this account.

This item is also included in the proposals for allocation under the Colonial Development and Welfare Scheme, and the remarks we have made in regard to such items apply to this one.

8. SEA AND AIR PORTS

It was explained to the Committee that a considerable amount of work would have to be done in the next few years if Singapore were to present its quarantine facilities as models, as it had done in the past. The work would fall into two parts, namely, the rehabilitation and extension of the quarantine station at St. John's Island and the provision of facilities at the new Changi Airport. The St. John's

Island station was designed thirty years ago and in the main was satisfactory, but the neglect from which it had suffered during the war, and modern requirements in respect of quarantine, demanded complete rehabilitation. It is proposed that of the sixteen existing Camps eight should be reconstructed at a cost of $400,000, and that the other eight should be rehabilitated at a cost of about $152,000. The plans for quarantine arrangements at Changi Airport are not ready yet, but it was expected that something like $270,000 would be required for this work.

The Committee agreed with these items. The Committee was informed that part of this work had been entered as one for an allocation of funds from the Colonial Development and Welfare Fund. The full amount could not be entered owing to the overall limit set for medical items in that scheme by the Singapore Committee dealing with the matter, but it was hoped to obtain sufficient money from the Fund to pay for one-half of the cost of the proposed work at St. John's Island. The remarks we have already made in regard to projects listed under the Colonial Development and Welfare Fund apply, therefore, to this item.

9. VENEREAL DISEASES HOSPITAL

Considerable discussion took place in the Committee in respect of this item, during which the desirability of making suitable provision at the General Hospital was considered as an alternative to having a Special hospital for the treatment of venereal diseases. The Medical Plan envisages a Hospital to accommodate 200 persons at a cost of $4\frac{1}{2}$ millions. The Committee eventually came to the conclusion that the building of a new Hospital to accommodate 200 persons should be postponed for further consideration in a few years time, that the work should continue to be done in the present hospital at Middle Road, but that the accommodation should be increased by making available those parts of the building that are at present used for staff accommodation, and building staff accommodation elsewhere. It was estimated that in this way accommodation could be increased from 50 to 120 beds. It was further considered that one clinic should be built at a suitable place, and that a travelling dispensary organisation should also be provided. The Committee recommends that the present buildings and the land on which they stand should be acquired under the provisions of the Land Acquisition Ordinance.

It is, therefore, recommended that item 9 be omitted from the Plan for the time being and that a new item on the above lines be substituted. A breakdown of the Estimates is shown in Appendix *D* to this Report.

We desire to emphasise, however, that it may be necessary to reconsider this problem in a few years' time.

10. ORTHOPÆDIC HOSPITAL

In connection with this item the Committee would refer to the additional item on page 7 of Council Paper No. 4 of 1948, namely a Tuberculosis Hospital of 300 beds at an estimated cost of $5,871,000. The Committee discussed the question of hospitalisation for tuberculosis at considerable length with reference to Council Paper No. 24 of 1948 prepared by the Director of Medical Services. After considerable discussion the Committee decided to recommend that the Medical Plan should contain provision for the building of a Sanatorium to include an Orthopædic section and that the present item should be deleted. We therefore asked for rough estimates to be prepared of the cost of such a hospital and these are set out in Appendix *E* to this Report. We accept these tentative estimates and recommend that this item, at a cost of $2,217,000, should be substituted for the present item at a cost of $1,100,000. In recommending the inclusion of this item in the Medical Plan we desire, however, to emphasise that it is not our intention that this should be a substitute for other measures in the fight against tuberculosis, namely the extension of Tan Tock Seng in the Medical Plan and the provision of other facilities in the ordinary Medical, Social Welfare and Education Departments' budgets. Tuberculosis, we are convinced, is a gigantic problem which can only be attacked successfully if attacked at every angle simultaneously, namely by better housing conditions, better feeding, school medical services, infant welfare, home treatment, etc. We therefore wish to state clearly that this item is recommended as an additional unit in the fight and not in substitution of those other methods of attack which we have outlined.

11. EXTENSION OF TAN TOCK SENG HOSPITAL

This item is shown in the Medical Plan as requiring $1\frac{1}{4}$ millions. In Committee the Director of Medical Services asked for a reconsideration of the original scheme to enable the question of quarters to be tackled satisfactorily. The Plan envisages that the whole of the 800 beds at Tan Tock Seng Hospital should be devoted to use as a hospital-clinic for the treatment of Tuberculosis. A revised

breakdown of estimates was produced to and examined by the Committee and is attached to this Report as Appendix *F*. It will be seen that the major part of the work is the provision of quarters. The Committee examined these proposals in detail and approved them. We therefore recommend that this item should stand in the Plan and that the estimate should be revised from $1,758,000 to $2,800,000.

12. RURAL LABOURERS' LINES

It was represented to the Committee that out of a total force of rural health labourers of 776, only 25 per cent were housed. We were informed that it is expected that the figure of 776 will remain fairly constant. The Committee were unanimously of the opinion that it should be an integral part of the Medical Plan to provide accommodation for all such labourers over a period of years. We also consider that quarters should be provided for Sanitary Inspectors, Technical Subordinates and other officers who are required to live in the area they serve. Revised estimates show a reduction on the original estimate of $2 millions for labourers' quarters of $400,000 to $1,600,000. If, however, the recommendation is accepted to provide quarters for Sanitary Inspectors and Technical Subordinates, a further amount of $670,000 will be necessary, making $2,270,000 in all.

We also consider that the description of this item should be changed to 'Health Department Housing'.

13. ANTI-MALARIA WORK

It was explained that this item cannot at present be allocated to any particular work, but is an attempt to make an intelligent forecast of special capital work which will be required in the future. Maintenance of present anti-malarial works is well-looked after by annual provision.

Although not an urgent matter, the Committee considered that the item should have a place in the Medical Plan if the picture of the future needs was to be correct. We therefore recommend its inclusion.

14. DISTRICT HOSPITALS

In view of the revision of item 3 relating to the General Hospital to provide for 1,500 beds instead of 1,000 beds as in the original 1947 Plan, and of the opinion expressed to us that patients generally preferred to go a longer distance to one good central hospital rather than a shorter distance to a secondary hospital, and of the desirability of waiting to see how the expansion of the town areas of Singapore might affect this problem, it was agreed that this item should be deleted from the Plan, but with a recommendation that the matter should be re-considered in a few years' time. This recommendation effects a reduction of $11 millions.

15. EXPANSION OF INFECTIOUS DISEASES HOSPITAL

The Director of Medical Services explained that a Special Committee was being formed to consider this problem, jointly with the Municipal Health authorities. For these reasons it was agreed that until the problem was more fully resolved this item could be omitted from the Plan.

16. MENTAL HOSPITAL IMPROVEMENTS

Before the war there were 1,800 patients in this hospital. The number was considerably fewer now owing largely to the callous attitude adopted by the Japanese towards this type of infirmity. The Committee supports the Director of Medical Services in considering that planning on the basis of a population of 2,000 inmates was reasonable. The Committee also agreed that provision should be made for recreational facilities. A revised estimate of cost was produced to the Committee and is attached as Appendix *G* to this Report. We recommend that this item be included in the Plan and that the estimated provision be increased from $1,880,000 to $3 millions.

17. ADDITIONAL ITEM

In the course of its discussions the Committee was asked to consider an additional item not appearing in the Plan contained in Council Paper No. 4 of 1948. This is a proposal by the Director of Medical Services to establish a Mental Defectives Home to house 150 low-grade defective and feeble-minded children who, without proper care and control, are liable to become a danger to public peace and morality. These children cannot be dealt with in the same way as adults, nor is their problem the same as that connected with handicapped children who, apart from their physical infirmities, are mentally normal. The proposal has the complete support of this Committee, and an item of $1 million has been entered in the Plan which we now recommend. A breakdown of the Estimates for this item

is contained in Appendix *H*. The question of the site for this Home was discussed at length, and it was agreed that the Home should be separate and distinct from the Mental Hospital and that it should be constructed in an area which made this distinction clear, even though it may be necessary to acquire land for the purpose.

7. The Committee endorses the opinion expressed in paragraph 3 of the Report of the Committee which assisted the Director of Medical Services (Annexure *B* to the Plan) that a ten-year period should be the maximum in which the proposals contained in this Plan should be completed. We have been much impressed by the medical needs of the Colony, and therefore strongly recommend that the revised Plan which we have prepared and attach as Appendix *I* to this Report should be approved, and that it should be carried out within the period of ten years into which we have fitted it.

It will be seen that the Plan we recommend for adoption is expected to cost about $33 millions compared with about $50 millions as set out in the original Plan. The reasons for this are mentioned at their appropriate places in this Report, but we may summarise the main reasons briefly and approximately as follows:—

(*a*) a saving on estimates for the General Hospital of $6 millions;

(*b*) a saving of $2\frac{3}{4}$ millions on the proposals for the Venereal Diseases Hospital;

(*c*) a saving of $250,000 on the Medical Store;

(*d*) a saving of $11 millions on the proposals for District Hospitals;

(*e*) a saving of $1\frac{1}{2}$ millions on the proposals for Infectious Diseases.

Against these savings, however, there has to be set additional expenditure in connection with the Tuberculosis Sanitorium ($1,000,000); extension at Tan Tock Seng ($1,000,000); Health Department Housing ($750,000); Mental Hospital improvements ($1,000,000) and the Home for Mentally Defective Children ($1,000,000).

In this connection we wish to emphasise two things. Firstly, some of the 'saved' items may have to be considered again at a later date; secondly, the figures given are not firm estimates. It would have been impossible for the work of this Committee to have been completed for a very long time if final lay-outs had had to be decided and final plans prepared. When this is done, some variations from the estimates given must be expected.

8. In conclusion we desire to record our thanks to our Secretary (Mrs. D. Alexander) for the able way in which she carried out her duties.

A. WILLIAMS, *Chairman.*
M. J. NAMAZIE.
C. C. TAN.
P. F. de SOUZA.
LIM YEW HOCK.

SINGAPORE, 12*th September,* 1948.

APPENDIX *A*

SINGAPORE GENERAL HOSPITAL

	$	$
Alterations to Existing Buildings:—		
Additional Storey over Ward 4	265,000	
Additional Storey over Ward 5	265,000	
New Theatre block	300,000	
Air Conditioning for above	60,000	
Two new lifts and one shaft	47,000	
Electrical work to Foregoing	66,000	
	———	1,003,000
Alterations to existing Ward (1)		20,000
Alterations to existing Ward (7)		20,000
Alterations to existing Ward (10)		20,000
Alterations to existing Ward (11)		20,000
Alterations to X'Ray Therapy and Theatres A and B		10,000
Additional Storey over Ward 17		300,000
Electrical work to last		22,500
Lift and Shaft to existing Theatre		27,000
Re-design Ward (14)		25,000
Demolition of old buildings		40,000
New Works:—		
Pathological Laboratory	350,000	
Piling	70,000	
	———	420,000
Out-patients Department		185,000
Children's 200 bed Wards		580,000
Laundry building	125,000	
Equipment	225,000	
	———	350,000
New Kitchens		100,000
Hospital Quarters:—		
M.O's quarters 27 numbers at $40,000		1,080,000
M.O's flats 34 numbers at $35,000		1,290,000
Sisters and Matrons quarters—83 suites + 6 rooms ...		800,000
Nurses hostel—110 rooms + 10 Air Conditioned rooms ...		800,000
Hospital servants 323 quarters (2 room units) (if single room units $1,250,000)		1,400,000
Laboratory Assistants and Dental Mechanics 20 single at $5,500 + 20 married at $15,000		410,000
15 garages and 12 quarters		70,000
Site Formation		50,000
Roads		200,000
Modernisation of electrical mains and substation		200,000
Modernisation of water supply		500,000
New Sewers		100,000
Acquisition of Land (not known)		
		10,042,500

APPENDIX *B*

KANDANG KERBAU HOSPITAL

					$
Existing Administration Block:—					
Three floors to be converted to provide 32 3rd class Ante Natal beds, Septic labour Room, 27 3rd class labour beds, creche and 48 3rd class maternity beds plus additional lavatory accommodation				...	60,000
Additional Storey to provide 64 3rd class maternity beds ...				...	200,000
Existing Out-patients Department converted to Nurses Quarters				...	10,000
Existing Maternity Block—converted to provide six 36 bed wards and extra lavatory accommodation				...	40,000
Electrical Work				...	11,000
New Building:—					
Labour Wards for 3 1st Class 6 2nd Class and 27 3rd Class patients					
Maternity Wards for 25 1st Class and 50 2nd Class patients					
Gynæcology Wards for 10 1st Class 27 2nd Class and 50 3rd Class patients					
Theatres—One Large One Septic					
Kitchen and Stores—					
Administration—					
Out-patients three Departments Path. laboratory, Dispensary X'ray Room, Admission, Almoner's Office Secretary, Clerical Staff, Steward, Stores					
Matrons' Room				...	1,038,000
Electrical Work on New Hospital Building ...				...	95,000
Quarters:—					
(1) Hospital Servants 360 Midwives 60					
420 2 room units ...				...	1,856,000
(2) M.O's quarters 12 numbers at $40,000 ...				...	480,000
(3) Hospital Assistants—10 married at $15,000 and 4 single at $5,000 ...				...	172,000
(4) Sisters and Nurses quarters:—					
Sisters 24 Matrons 4					
28 suites plus 2 air conditioned rooms				...	225,000
Nurses 75 single rooms 52 double rooms plus 6 air conditioned rooms				...	953,850
(5) Five Garages and nine syces quarters ...				...	25,000
Ancillary Works:—					
Piled foundations to all new buildings ...				...	945,000
Sewers to new building				...	50,000
Water supply to new building				...	8,000
Roads and two new bridges—Roads ...			$70,000		
Bridges ...			$20,000		
					90,000
Fences				...	6,000
Acquisition of Land (not known)				...	
					6,264,850
		Contingencies		...	335,150
		Total		...	6,600,000

APPENDIX *C*

KANDANG KERBAU HOSPITAL

SCHEDULE OF PROPOSED ACCOMMODATION

		Beds	*Beds*
Existing Administration Block:—			
Ground Floor—			
3rd Class Ante Natal:			
Two 8 bed wards		16	
One 16 bed ward		16	
			32
A Septic Labour Room:			
First Floor—			
3rd Class Labour:			
Three 9 bed wards			27
Creche			
Second Floor—			
3rd Class Maternity:			
One 24 bed ward		24	
One 9 bed ward		9	
One 8 bed ward		8	
One 4 bed ward		4	
One 3 bed ward		3	
			48
Additional Storey—(New)			
3rd Class Maternity			
Two 32 bed wards			64
Existing Maternity Block—			
Six 36 bed wards			216
	Total 3rd Class ...		387
New Building:—			
Second Class Maternity—			
Ten 5 bed wards		50	
Second Class Labour—			
Three 2 bed wards		6	
			56
First Class Maternity—			
Nine double wards ...	18 beds		
Seven single wards ...	7 beds		
		25	
Labour—Three Single Units		3	
			28
Isolation (All Classes)—			
Thirty cubicles			30
Gynæcology—			
3rd Class—Five 10 bed wards ...		50	
2nd Class—Three 9 bed wards ...		27	
1st Class—Ten single bed wards ...		10	
			87
	Total ...		588

SUMMARY

Class	Antenatal	Maternity	Labour	Gynae-cology	Total	Isolation
1st ...	—	25	3	10	38	30
2nd ...	—	50	6	27	83	
3rd ...	32	328	27	50	437	
Total ...	32	403	36	87	558 + 30 = 588	

APPENDIX *D*

VENEREAL DISEASES HOSPITAL

Conversion of existing Venereal Diseases Hospital at Middle Road to accommodate 120 beds

	$	$
Existing Buildings:—		
Alterations and additions to three existing buildings ...		100,000
New Buildings:—		
Chief Medical Officer's House 1	40,000	
Quarters for Medical Officers 5	175,000	
Quarters for Sisters, Supervisor, Laboratory Assistants, Hospital Assistants and Clerks 42	630,000	
Quarters for Nurses and Female Clerks 33	264,000	
Quarters for Hospital Servants 46	200,000	
Garages for 4 Ambulances	10,000	
Ancillaries	91,000	
		1,410,000
Clinic:—		
Building for Clinic	80,000	
Quarters for Medical Officers 2	70,000	
Quarters for Hospital Assistants 6	90,000	
		240,000
		1,750,000

APPENDIX *E*

NEW 300 BED T.B. HOSPITAL NEAR BEDOK— PRELIMINARY ESTIMATE OF COST

	$	$
Hospital:—		
Three two storey Ward Blocks each of 100 beds at $280,000		840,000
Administration block single storey		70,000
Kitchen block single storey		60,000
Covered ways		5,000
Electrical work		77,500
Quarters:—		
Senior M.O.	45,000	
2 A.M.Os. at $35,000	70,000	
1 Matrons quarters	35,000	
5 Sisters quarters	40,000	
35 Nurses quarters	270,000	
6 Hospital Assistants quarters	42,000	
8 Cooks, 80 Ward Staff, 10 Kebuns, 10 Artisans—Total 108 quarters	370,000	
		872,000
Ancillary Works:—		
Roads say one mile		47,500
Sewer and disposal plant		30,000
Water Supply		25,000
Site Formation		40,000
Contingencies		150,000
Total ...		2,217,000

APPENDIX *F*

TAN TOCK SENG HOSPITAL

	$
Improvements:—	
Modern Sanitation to existing Mandalay Road Hospital and quarters	97,000
Re-roofing 18 wards and covered ways with asbestos, replacing corrugated iron	113,000
Quarters:—	
Medical Officers Quarters—	
Extensive repairs to five existing, new quarters 3 numbers ...	200,000
Sisters quarters—	
10 Sisters plus 1 Almoner—11 suites	88,000
Nurses quarters—	
Hostel for 60 Nurses (if Students' Hostel available no expenditure required on this item)	300,000
Hospital Assistants quarters—	
Extensive repairs to 19 married quarters	95,000
Extensive repairs to 12 single quarters	18,000
Extensive repairs to Bachelors Mess 12	10,000
New married quarters for 31 families	465,000
New single quarters for six single	33,000
Hospital Servants quarters—	
New quarters for 172 families	745,000
New quarters for 88 single	340,000
Ancillary Works:—	
Water Supply	30,000
Sanitation	75,000
Roads (say one mile)	47,000
Site formation	20,000
	2,676,000
Contingencies ...	124,000
Total ...	2,800,000

APPENDIX *G*

MENTAL HOSPITAL

	$	$
Essential Works:—		
Two 50 bed wards	225,000	
Pantry to each ward	30,000	
Two T.B. wards	125,000	
Cold room of 1,000 cub. ft.	10,000	
New boiler house and move existing boilers etc. ...	9,000	
Clerk and Stewards stores	100,000	
Garage, two vehicles and quarters for two drivers ...	12,000	
Quarters:—		
2 M.Os. at $40,000	80,000	
6 Nursing Sisters and Matron	60,000	
12 Hospital Assistants or similar	120,000	
320 Hospital Servants	1,393,000	
32 Local Nurses	256,000	
Four Male Nurses	80,000	
		2,500,000
Desirable Works:—		
Modernisation of wards	120,000	
Two rooms for visitors	12,000	
Renovation of Male Workers Dining Room	2,250	
Store for farm implements, etc.	17,300	
Occupational Therapy	85,000	
Central recreation hall	80,000	
Work on Kitchens	10,000	
Gate Lodge	3,500	
Day rooms to two wards	30,000	
Airing Court to one female ward	1,000	
		361,050
Contingencies say ...		138,950
		3,000,000

APPENDIX *H*

HOME FOR MENTALLY DEFECTIVE CHILDREN

	$
150 bedded children's wards	435,000
Quarters for Medical Officer 1	40,000
Quarters for one Matron and five Sisters	50,000
Quarters for one Steward and two Hospital Assistants	45,000
Quarters for Hospital Servants 80	345,000
Ancillaries	85,000
Total ...	1,000,000

APPENDIX I

MEDICAL PLAN

Institution	1949	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year	Total
	$	$	$	$	$	$	$	$	$	$	$	$
1. *Base Medical Store Pharmacy School and Essential Manufactory	145,000	152,000	153,000	..	..	..	..	..	..	..	..	450,000
2.†Leper Settlement	114,000	114,000	200,000	200,000	152,000	..	..	..	..	..	..	780,000
3.‡General Hospital	..	760,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,282,000	10,042,000
4. Kandang Kerbau Hospital ..	..	587,000	587,000	500,000	500,000	500,000	750,000	1,000,000	1,000,000	1,076,000	100,000	6,600,000
5. §Rural Clinics and Dispensaries	82,000	90,000	90,000	90,000	90,000	90,000	110,000	110,000	32,000	..	..	784,000
6. St. John's Island Water Supply	..	..	..	250,000	..	..	..	..	..	..	..	250,000
7. Medical and Dental School Clinic	..	215,000	..	..	..	..	..	..	..	..	..	215,000
8. Sea and Air Ports ..	..	..	200,000	200,000	100,000	100,000	72,000	150,000	..	..	..	822,000
9. Venereal Diseases Hospital ..	..	..	250,000	250,000	250,000	250,000	250,000	250,000	250,000	..	..	1,750,000
10. T.B. Sanatorium	..	..	750,000	750,000	500,000	217,000	..	..	..	..	..	2,217,000
11. Tan Tock Seng Hospital ..	..	288,000	250,000	250,000	250,000	500,000	500,000	500,000	..	262,000	..	2,800,000
12. Health Department Housing ($100,000 (1948)) ..	100,000	100,000	100,000	200,000	200,000	200,000	200,000	300,000	300,000	200,000	370,000	2,270,000
13. Anti-Malarial	..	..	..	..	..	50,000	50,000	50,000	50,000	100,000	200,000	500,000
14. Mental Hospital	..	60,000	140,000	100,000	100,000	100,000	500,000	500,000	500,000	500,000	500,000	3,000,000
15. Mental Defective	..	..	..	200,000	200,000	200,000	200,000	200,000	..	..	..	1,000,000
Total Capital Expenditure ..	**441,000**	**2,366,000**	**3,720,000**	**3,990,000**	**3,342,000**	**3,207,000**	**3,632,000**	**4,060,000**	**3,132,000**	**3,138,000**	**2,452,000**	**33,480,000**
Approximate Annual Increase above present Annually Recurrent Expenditure	..	250,000	500,000	1,000,000	1,500,000	2,000,000	2,750,000	3,000,000	3,750,000	4,000,000	4,000,000	Expected annual increase in recurrent expenditure on completion of Plan—4 millions.

*Completed. †Half completed. ‡New nurses home and new out-patients department in process of completion. Other minor improvements carried out. §Two completed.

Note.:— A very considerable advance is planned for 1953.

APPENDIX *II*

FINANCIAL STATEMENT FOR 1952

(*a*) Receipts

Hospital Fees, etc.	Medical General and Health	Total
$992,727.97	$208,524.72	$1,201,252.69

(*b*) Payments

——	Medical General	Hospitals and Dispensaries	Health Branch	Social Hygiene Branch	Government Medical Store	Total
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Personal Emoluments	707,412 77	6,531,606 51	1,084,399 07	129,806 86	112,052 15	8,565,277 36
Other Charges Annually Recurrent ..	86,873 40	5,419,779 87	767,451 39	107,538 27	475,090 05	6,856,732 98
Other Charges Special Expenditure ..	990 80	315,432 13	46,045 77	6,651 17	211,600 97	580,720 84
Total ..	795,276 97	12,266,818 51	1,897,896 23	243,996 30	798,743 17	16,002,731 18

Note:—Includes (*a*) Contribution to Tan Tock Seng Hospital. (*b*) Cost of Indents on Crown Agents.

APPENDIX *III*

IN-PATIENTS ALL HOSPITALS FOR THE YEAR 1952

The following table shows the hospitals maintained by the Medical Department, Singapore, the daily average number of patients in each, the number of patients admitted during the year, the total number of patients treated, the number of deaths and the death rate per hundred treated (the Quarantine Hospital and Leper Settlement are not included).

Hospitals	Average No. of patients	Admissions during the year	CASES TREATED DURING THE YEAR			Deaths	Mortality per cent
			Male	Female	Total		
General Hospital	738.42	22,753	16,156	7,265	23,421	2,599	11.10
T.T.S.H. (T.B. and General)	547.11	1,465	1,667	336	2,003	235	11.73
K.K. Hospital .. Maternity ..	205.00	17,380	..	17,580	17,580	59	.35
K.K. Hospital .. Gynaecology ..	45.00	3,046		3,090	3,090	13	
Police Head Quarters	14.57	560	573	..	573	..	..
H. M. Prison Outram Road	56.43	1,183	1,222	..	1,222	3	0.24
H. M. Prison Changi	17.00	210	236	..	236	2	0.85
Woodbridge Hospital	1,618.00	977	1,535	869	2,404	95	3.95
St. Andrew's Orthopaedic Hospital ..	76.55	79	96	59	155	..	..
Social Hygiene	43.00	2,434	473	1,983	2,456	7	0.29
Middleton Hospital	90.00	1,796	1,211	706	1,917	120	6.26
Total (Including 644 Transfers) ..	..	51,883	23,169	31,888	55,057	3,133	5.69

N.B.:—Total cases treated in 1951: 49,264.

HOSPITALS, COLONY OF SINGAPORE, IN-PATIENTS*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952

Intermediate List of 150 Causes for Tabulation of Morbidity and Mortality (see Foot Note)

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL Admissions	YEARLY TOTAL Deaths	‡Total cases treated	§Remaining at end of 1952	Remarks
		I.—*Infective and Parasitic Diseases*						
A 1	001–008	Tuberculosis of respiratory system ..	444	1,699	270	2,143	451	
A 2	010	Tuberculosis of meninges and central nervous system	15	156	125	171	11	
A 3	011	Tuberculosis of intestines, peritoneum and mesenteric glands	1	28	9	29	3	
A 4		Tuberculosis of bones and joints:—						
(*a*)	012.0, 013.0	Tuberculosis of the vertebral column ..	40	105	3	145	57	
(*b*)	012, 013 except 012.0, 013.0	Tuberculosis of other bones and joints	59	141	..	200	49	
A 5		Tuberculosis, all other forms:—						
(*a*)	014	Tuberculosis of skin and subcutaneous cellular tissue	..	..	..	..	..	
(*b*)	015	Tuberculosis of lymphatic system ..	2	47	1	49	1	
(*c*)	016	Tuberculosis of genito-urinary system	2	18	1	20	..	
(*d*)	017	Tuberculosis of adrenal glands ..	..	..	..	..	..	
(*e*)	018	Tuberculosis of other organs ..	3	16	3	19	1	
(*f*)	019	Disseminated tuberculosis ..	1	63	40	64	1	
		Carried forward ..	567	2,273	452	2,840	574	

The headings are taken from the Intermediate List of 150 Causes for Tabulation of Morbidity and Mortality as published in the 'Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death' (Sixth Revision of the International Lists of Diseases and Causes of Death, 1948).

Reference should be made to the Detailed List of the Diseases published on pages 45 to 321 of the above Manual whenever there is any doubt about the entry in the list.

* Excluding cases in Leper Settlement.

† *i.e.* the year previous to that for which the return is made.

‡ 'Total cases treated' will, of course, include those remaining in Hospital at the end of the previous year.

The figures in this column to be carried on to the next year's Return.

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	567	2,273	452	2,840	574	
		I.—Infective and Parasitic Diseases —contd.						
A 6	020	Congenital syphilis	1	97	10	98	5	
A 7		Early Syphilis:—						
(*a*)	021.0–021.1	Primary syphilis	..	28	..	28	..	
(*b*)	021.2	Secondary syphilis	6	84	1	90	6	
(*c*)	021.3	Early syphilis, relapse following treatment	..	..	..	..	..	
(*d*)	021.4	Early syphilis (unspecified stage) ..	..	..	..	..	..	
A 8	024	Tabes dorsalis	2	8	..	10	2	
A 9	025	General paralysis of insane ..	2	13	1	15	1	
A 10		All other syphilis:—						
(*a*)	022	Aneurysm of aorta	1	22	8	23	1	
(*b*)	023	Other cardiovascular syphilis ..	..	..	..	..	..	
(*c*)	026	Other syphilis of central nervous system	..	..	..	..	..	
(*d*)	027	Tertiary syphilis	9	265	2	274	7	
(*e*)	028	Latent syphilis	..	..	..	..	..	
(*f*)	029	Syphilis unqualified	9	688	15	697	2	
A 11		Gonococcal infections:—						
(*a*)	030	Acute or unspecified gonorrhoea ..	..	170	..	170	1	
(*b*)	031	Chronic gonococcal infection of genito-urinary system	..	..	..	..	..	*See* A 11 (*e*)
(*c*)	032	Gonococcal infection of joint ..	..	..	..	..	..	*See* A 11 (*e*)
(*d*)	033	Gonococcal infection of eye ..	..	61	..	61	1	
(*e*)	034–035	Gonococcal infection of other sites ..	1	36	..	37	3	Includes A 11 (*b*), (*c*)
A 12	040	Typhoid fever	36	163	10	199	10	
		Carried forward ..	634	3,908	499	4,542	613	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	634	3,908	499	4,542	613	
		I.—Infective and Parasitic Diseases —contd.						
A 13		Paratyphoid fever and other Salmonella infections:—						
(*a*)	041	Paratyphoid fever A, B or C ..	..	5	..	5	..	
(*b*)	042	Other Salmonella infections ..	..	..	..	..	..	
A 14	043	Cholera	..	..	..	..	..	
A 15	044	Brucellosis (undulant fever) ..	..	..	..	..	..	
A 16		Dysentery, all forms:—						
(*a*)	045	Bacillary dysentery	1	32	1	33	..	
(*b*)	046	Amoebiasis	8	120	12	128	1	
(*c*)	..	Mixed	..	..	..	..	..	
(*d*)	047–048	Other protozoal and unspecified forms of dysentery	3	13	..	16	1	
A 17	050	Scarlet fever	..	..	..	..	..	
A 18	051	Streptococcal sore throat	..	..	..	..	..	
A 19	052	Erysipelas	1	5	2	6	..	
A 20	053	Septicaemia and pyaemia	..	49	31	49	1	
A 21	055	Diphtheria	18	487	82	505	22	
A 22	056	Whooping Cough	..	9	1	9	..	
A 23	057	Meningococcal infections	..	3	1	3	..	
A 24	058	Plague:—						
(*a*)	058.0	Bubonic	..	..	..	..	..	
(*b*)	058.1	Pneumonic	..	..	..	..	..	
(*c*)	058.2	Septicaemic	..	..	..	..	..	
(*d*)	058.2	Undefined	..	..	..	..	..	
A 25	060	Leprosy	2	15	..	17	2	
		Carried forward ..	667	4,646	629	5,313	640	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	667	4,646	629	5,313	640	
		I.—*Infective and Parasitic Diseases —contd.*						
A 26		Tetanus:—						
(*a*)	061	Tetanus of the new-born	..	18	17	18	..	
(*b*)	..	Tetanus, other forms	2	70	23	72	2	
A 27	062	Anthrax	..	..	..	..	..	
A 28	080	Acute Poliomylitis	34	55	10	89	40	
A 29	082	Acute infectious encephalitis ..	..	5	..	5	..	
A 30	081, 083	Late effects of acute poliomyelitis and acute infectious encephalitis ..	..	..	..	..	..	
A 31	084	Small-pox	..	..	..	..	..	
A 32	085	Measles	4	157	7	161	..	
A 33	091	Yellow fever	..	..	..	..	..	
A 34	092	Infectious hepatitis	..	..	..	..	..	
A 35	094	Rabies	..	..	..	..	..	
A 36		Typhus and other rickettsial diseases:—						
(*a*)	100	Louse-borne epidemic typhus ..	..	..	..	..	..	
(*b*)	101	Flea-borne endemic typhus (murine) ..	..	7	..	7	..	
(*c*)	104	Tick-borne epidemic typhus ..	..	..	..	..	..	
(*d*)	105	Mite-borne typhus	..	16	..	16	..	
(*e*)	102–103, 106–108	Other and unspecified typhus ..	..	22	..	22	..	
		Carried forward ..	707	4,996	686	5,703	682	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	707	4,996	686	5,703	682	
		I.—*Infective and Parasitic Diseases —contd.*						
A 37		Malaria:—						
(*a*)	110	Vivax malaria (benign tertian) ..	1	45	..	46	1	
(*b*)	111	Malariae malaria (quartan) ..	..	1	..	1	..	
(*c*)	112	Falciparum malaria (malignant tertian)	2	81	7	83	1	
(*d*)	114	Mixed malaria infections ..	..	4	..	4	..	
(*e*)	115	Blackwater fever	..	..	..	..	..	
(*f*)	113, 116–117	Other and unspecified forms of malaria	7	78	1	85	1	
A 38		Schistosomiasis:—						
(*a*)	123.0	Schistosomiasis vesical (S. haematobium)	..	..	..	..	..	
(*b*)	123.1	Schistosomiasis intestinal (S. Mansoni)	..	..	..	..	..	
(*c*)	123.2	Schistosomiasis Pulmonary (S. Japonicum)	..	..	..	..	..	
(*d*)	123.3	Other and unspecified Schistosomiasis	..	..	..	..	..	
A 39	125	Hydatid disease	..	..	..	..	..	
A 40		Filariasis:—						
(*a*)	127	Onchocærciasis	..	..	..	..	..	
(*b*)	..	Loiasis	..	..	..	..	..	
(*c*)	..	Filariasia bancrofti	1	21	..	22	..	
(*d*)	..	Other filariasis	..	..	..	..	..	
A 41	129	Ankylostomiasis	..	77	1	77	..	
A 42		Other diseases due to helminths:—						
(*a*)	126	Tape worm (infestation) and other cestode infestation	..	..	..	..	..	
		Carried forward ..	718	5,303	695	6,021	685	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	718	5,303	695	6,021	685	
		I.—*Infective and Parasitic Diseases —contd.*						
A 42 (*b*)	130.0	Ascariasis	1	108	3	109	1	
(*c*)	130.3	Guinea worm (dracunculosis) ..	..	..	..	..	..	
(*d*)	124	Other trematode infestation ..	..	..	..	..	..	
(*e*)	128	Trichiniasis	..	..	..	..	..	
(*f*)	130.1–130.2	Other diseases due to helminths ..	..	17	..	17	..	
A 43		All other diseases classified as infective and parasitic:—						
(*a*)	036	Chancroid	1	11	..	12	..	
(*b*)	037	Lumphogranuloma venereum ..	1	16	..	17	6	
(*c*)	038	Granuloma inguinale, non-venereal ..	1	1,053	..	1,054	27	
(*d*)	039	Other and unspecified venereal diseases	1	30	..	31	3	
(*e*)	049	Food poisoning (infection and intoxication)	..	17	..	17	..	
(*f*)	059	Tularaemia	..	..	..	..	..	
(*g*)	063	Gas Gangrene	..	..	..	..	..	
(*h*)	064.2	Glanders	..	..	..	..	..	
(*i*)	064.3	Melioidosis	..	..	..	..	..	
(*j*)	064	Other bacterial diseases	..	..	..	..	..	
(*k*)	070	Vincent's infection	..	33	1	33	..	
(*l*)	071	Relapsing fever	..	2	..	2	..	
(*m*)	072	Leptospirosis icterohaemorrhagica (Well's disease)	..	19	3	19	..	
(*n*)	073	Yaws	..	1	..	1	..	
(*o*)	086	Rubella	..	19	..	19	..	
		Carried forward ..	723	6,629	702	7,352	722	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	723	6,629	702	7,352	722	
		I.—*Infective and Parasitic Diseases —contd.*						
A 43 (*p*)	087	Chicken-pox	8	452	..	460	13	
(*q*)	088	Herpes Zoster	..	27	..	27	1	
(*r*)	089	Mumps	2	90	..	92	..	
(*s*)	090	Dengue	..	98	..	98	1	
(*t*)	093	Glandular fever	..	..	..	..	..	
(*u*)	095	Trachoma	2	49	..	51	2	
(*v*)	096.7	Sandfly fever	..	..	..	..	..	
(*w*)	120	Leishmaniasis	..	..	..	..	..	
(*x*)	121.0	Trypanosomiasis gambiensis ..	..	..	..	..	..	
(*y*)	121.0	Trypanosomiasis rhodesiensis ..	..	..	..	..	..	
(*z*)	121	Other and unspecified trypanosomiasis	..	..	..	..	..	
(*A*)	131	Dermatophytosis	..	1	..	1	..	
(*B*)	132	Actinomycosis	..	6	1	6	..	
(*C*)	133,134	Other mycotic infections	..	1	..	1	..	
(*D*)	135	Scabies	7	55	..	62	..	
(*E*)	054, 074 096.1–096.6 096.8, 096.9 122 136–138	All other diseases classified as infective and parasitic	..	1	..	1	..	
		Carried forward ..	742	7,409	703	8,151	739	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	742	7,409	703	8,151	739	
		II.—*Neoplasms*						
A 44	140–148	Malignant neoplasm of buccal cavity and pharynx	3	90	25	93	1	Comprises A 44 and A 45
A 45	150	Malignant neoplasm of oesophagus ..						
A 46	151	Malignant neoplasm of stomach ..	4	92	32	96	..	
A 47		Malignant neoplasm of intestine except rectum:—						
	(*a*) 152	Malignant neoplasm of small intestine, including duodenum	..	..	..	..	..	See A 57 (*d*)
	(*b*) 153	Malignant neoplasm of large intestine, except rectum	..	..	..	..	..	
A 48	154	Malignant neoplasm of rectum ..	..	..	..	..	..	
A 49	161	Malignant neoplasm of larynx ..						
A 50	162–163	Malignant neoplasm of trachea, and of bronchus and lung not specified as secondary	2	63	25	65	9	Comprises A 49 and A 50
A 51	170	Malignant neoplasm of breast ..	..	50	3	50	..	
A 52	171	Malignant neoplasm of cervix uteri ..						
A 53	172–174	Malignant neoplasm of other and unspecified parts of uterus ..	1	276	5	277	..	Comprises A 52 and A 53
A 54	177	Malignant neoplasm of prostate ..	..	..	..	..	..	See A 57 (*f*)
A 55	190–191	Malignant neoplasm of skin ..	..	17	2	17	..	
A 56	196–197	Malignant neoplasm of bone and connective tissue	..	..	..	..	..	See A 57 (*h*)
		Carried forward ..	752	7,997	795	8,749	749	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	752	7,997	795	8,749	749	
		II.—*Neoplasms—continued*						
A 57		Malignant neoplasm of all other and unspecified sites:—						
(*a*)	155–156	Malignant neoplasm of liver ..	1	79	27	80	1	
(*b*)	157	Malignant neoplasm of pancreas ..	..	..	..	..	..	} *See* A 57 (*d*)
(*c*)	158	Malignant neoplasm of peritoneum ..	..	..	..	..	..	
(*d*)	159	Malignant neoplasm of unspecified digestive organs	4	58	19	62	3	Comprises A 47, A 48, A 57 (*b*), (*c*) and (*d*)
(*e*)	175–176	Malignant neoplasm of other and unspecified female genital organs ..	..	16	2	16	..	
(*f*)	178–179	Malignant neoplasm of other and unspecified male genital organs ..	1	56	15	57	1	Includes A 54
(*g*)	180–181	Malignant neoplasm of kidney, bladder and other urinary organs ..	..	..	..	..	..	*See* A 57 (*h*)
(*h*)	160 164–165 192–195 198–199	Malignant neoplasm of all other and unspecified sites	8	172	37	180	10	Includes A 56, A 57 (*g*)
A 58	204	Leukaemia and Aleukaemia ..	3	36	17	39	4	
A 59		Lymphosarcoma and other neoplasm of lymphatic and haematopoietic system:—						
(*a*)	200	Lymphosarcoma and reticulosaroma ..	..	..	..	..	..	
(*b*)	201	Hodgkin's disease	1	3	1	4	..	
		Carried forward ..	770	8,417	913	9,187	768	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	770	8,417	913	9,187	768	
		II.—*Neoplasms—continued*						
A 59 (*c*)	202–203	Other neoplasm of lymphatic and haematopoietic system	..	..	..	..	..	
A 60		Benign neoplasms and neoplasms of unspecified nature:—						
(*a*)	210–211	Bengin neoplasm of buccal cavity, pharynx and digestive system ..	..	..	..	..	..	*See* A 60 (*d*)
(*b*)	217	Benign neoplasm of other female genital organs	..	180	5	180	..	
(*c*)	218	Benign neoplasm of other male genital organs	..	..	..	..	..	*See* A 60 (*d*)
(*d*)	212–216 219–229	Benign neoplasm of other and unspecified organs and tissue ..	2	173	4	175	2	Comprises A 60 (*a*), (*c*) and (*d*)
(*e*)	230	Neoplasm of unspecified nature of digestive organs	..	..	..	..	..	*See* A 60 (*g*)
(*f*)	233–235	Neoplasm of unspecified nature of other female genital organs	2	17	..	19	..	
(*g*)	231–232 236–239	Neoplasm of unspecified nature of other unspecified organs	..	47	4	47	2	Includes A 60 (*e*)
		Carried forward ..	774	8,834	926	9,608	772	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	774	8,834	926	9,608	772	
		III.—*Allergic, Endocrine System, Metabolic and Nutritional Diseases*						
A 61	250–251	Nontoxic goitre	1	54	1	55	1	
A 62	252	Thyrotoxicosis with or without goitre ..	12	96	3	108	13	
A 63	260	Diabetes mellitus	9	210	8	219	6	
A 64		Avitaminosis and other deficiency states:—						
(*a*)	280	Beri Beri	2	42	12	44	2	
(*b*)	281	Pellagra	..	2	..	2	1	
(*c*)	282	Scurvy	..	2	..	2	..	
(*d*)	283–284	Rickets	..	21	..	21	..	
(*e*)	285	Osteomalacia	..	..	..	..	..	
(*f*)	286.0	Sprue	..	2	..	2	..	
(*g*)	286.5	Malnutrition	..	..	..	..	..	
(*h*)	286.1–286.4 286.6	Other deficiency states	..	25	1	25	..	
		Carried forward ..	798	9,288	951	10,086	795	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	798	9,288	951	10,086	795	
		IV.—*Diseases of the Blood and Blood-Forming Organs*						
A 65		Anaemias:—						
(*a*)	290	Pernicious and other hyperchromic anaemias	..	42	7	42	2	
(*b*)	291	Iron deficiency anaemias (hypochromic)	5	9	1	14	5	
(*c*)	292–293	Other specified and unspecified anaemias	10	161	17	171	8	
A 66		Allergic disorders; all other indocrine, metabolic and blood diseases:—						
(*a*)	241	Asthma	3	231	5	234	11	
(*b*)	240	Angioneurotic oedema, urticaria and other allergic disorders ..	..	..	..	..	..	*See* A 66 (*l*)
	242–245							
(*c*)	253	Myxoedema and cretinism ..	..	..	..	..	..	
(*d*)	254	Other diseases of thyroid gland ..	..	..	..	..	..	*See* A 66 (*f*)
(*e*)	270	Disorders of pancreatic internal secretion other than diabetes mellitus ..	..	..	..	..	..	
(*f*)	271	Diseases of parathyroid gland ..	..	7	..	7	..	Includes A 66 (*d*)
(*g*)	272	Diseases of pituitary gland ..	..	2	..	2	..	
(*h*)	273	Diseases of Thymus gland ..	..	..	..	..	..	
(*i*)	274	Diseases of adrenal gland ..	..	2	2	2	..	
(*j*)	275–277	Other diseases of endocrine glands ..	..	..	..	..	..	*See* A 66 (*l*)
(*k*)	288	Gout	..	2	..	2	..	
(*l*)	287,289	Other metabolic diseases ..	1	4	1	5	..	Includes A 66 (*b*) and (*j*)
(*m*)	294	Polycythemia	..	..	..	..	..	
		Carried forward ..	817	9,748	984	10,565	821	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL Admissions	YEARLY TOTAL Deaths	‡Total cases treated	§Remaining at end of 1952	Remarks
		Brought forward ..	817	9,748	984	10,565	821	
		IV.—*Diseases of the Blood and Blood-Forming Organs—contd.*						
A 66 (*n*)	295	Haemophilia	..	2	..	2	..	
(*o*)	296	Purpura and other haemorrhagic conditions	..	16	4	16	1	
(*p*)	297	Agranulocytosis	..	..	..	..	..	*See* A 66 (*r*)
(*q*)	298	Diseases of spleen	..	19	3	19	1	
(*r*)	299	Other diseases of blood and blood-forming organs	..	..	..	..	..	Includes A 66 (*p*)
		V.—*Mental, Psychoneurotic and Personality Disorders*						
A 67		Psychoses:—						
(*a*)	300	Schizophrenic disorders (dementia praecox)	..	..	..	..	..	
(*b*)	301	Maniac-depressive reaction ..	..	..	..	..	..	*See* A 67 (*f*)
(*c*)	302	Involutional melancholia ..	..	..	..	..	..	
(*d*)	303	Paranoia and paranoid states ..	..	..	..	..	..	
(*e*)	304	Senile psychoses	..	2	..	2	1	
(*f*)	305–309	Other and unspecified psychoses ..	1,427	1,015	95	2,442	1,743	Comprises A 67 (*a*)—(*d*),(*f*); A 68 (*b*); and A 69
		Carried forward ..	2,244	10,802	1,086	13,046	2,567	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,244	10,802	1,086	13,046	2,567	
		V.—*Mental, Psychoneurotic and Personality Disorders—contd.*						
A 68		Psychoneurosis and disorders of personality:—						
	(*a*) 311	Hysterical reaction	1	28	..	29	..	
	(*b*) 314	Neurotic-depressive reaction ..	..	..	..	..	..	*See* A 67 (*f*)
	(*c*) 322	Alcoholism	..	43	..	43	1	
	(*d*) 323	Other drug addiction	5	592	1	597	28	
	(*e*) 310,312–313 315–321,324 326	Other psychoneuroses and disorders of personality	..	4	..	4	..	
A 69	325	Mental deficiency	..	..	..	..	..	*See* A 67 (*f*)
		VI.—*Diseases of the Nervous System and Sense Organs*						
A 70		Vascular lesions affecting central nervous system:—						
	(*a*) 331	Cerebral haemorrhage	11	223	63	234	26	Comprises A 70 (*a*), (*b*) and (*c*)
	(*b*) 332	Cerebral embolism and thrombosis ..						
	(*c*) 330 333–334	Other vascular lesions affecting central nervous system						
		Carried forward ..	2,261	11,692	1,150	13,953	2,622	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,261	11,692	1,150	13,953	2,622	
		VI.—*Diseases of the Nervous System and Sense Organs—contd.*						
A 71	340	Non-meningococcal meningitis ..	6	104	43	110	6	
A 72	345	Multiple sclerosis	..	..	..	..	..	
A 73	353	Epilepsy	3	80	..	83	3	
A 74		Inflammatory diseases of eye:—						
(*a*)	370	Conjunctivitis and ophthalmia ..	2	205	..	207	6	
(*b*)	371–379	Other inflammatory diseases of eye ..	..	..	..	..	..	*See* A 78 (*a*)
A 75	385	Cataract	22	402	4	424	24	
A 76	387	Glaucoma	..	..	..	..	..	*See* A 78 (*a*)
A 77		Otitis media and mastoiditis:—						
(*a*)	390	Otitis externa	..	12	..	12	..	
(*b*)	391–393	Otitis media and mastoiditis ..	1	53	2	54	3	
(*c*)	394	Other inflammatory diseases of ear ..	..	..	..	..	..	
A 78		All other diseases of the nervous system and sense organs:—						
(*a*)	380–384, 386,388, 389	All other diseases and conditions of eye	34	1,000	4	1,034	22	Includes A 74 (*b*); A 76
		Carried forward ..	2,329	13,548	1,203	15,877	2,686	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,329	13,548	1,203	15,877	2,686	
		VI. *Disease of the Nervous System and Sense Organs—contd.*						
A 78	(*b*) 342	Intracranial and intraspinal abscess ..	..	7	7	7	..	
	(*c*) 343	Encephalitis, myelitis and encephalomyelitis	3	69	29	72	1	
	(*d*) 350	Paralysis agtans	27	1	5	28	20	
	(*e*) 352	Other cerebral paralysis	..	..	..	..	..	} *See* A 78 (*k*)
	(*f*) 356	Motor neurone disease and muscular atrophy	..	..	..	..	..	
	(*g*) 357	Other diseases of spinal cord ..	25	57	1	82	20	
	(*h*) 366	Other and unspecified forms of neuralgia and neuritis	1	43	..	44	8	
	(*i*) 367	Other diseases of cranial nerves ..	..	..	..	..	..	} *See* A 78 (*k*)
	(*j*) 369	Diseases of peripheral autonomic nervous system	..	..	..	..	..	
	(*k*) 341,344 351,354 355 360–365 368 395–398	All other diseases of the nervous system and sense organs	11	156	3	167	6	Includes A 78 (*e*), (*f*), (*i*) and (*j*)
		Carried forward ..	2,396	13,881	1,248	16,277	2,741	

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,396	13,881	1,248	16,277	2,741	
		VII.—*Diseases of the Circulatory System*						
A 79		Rheumatic fever:—						
	(*a*) 400	Rheumatic fever without mention of heart involvement	1	11	1	12	1	
	(*b*) 401	Rheumatic fever with heart involvement	1	71	19	72	6	
	(*c*) 402	Chorea	..	1	1	1	..	
A 80		Chronic rheumatic heart disease:—						
	(*a*) 410–413	Diseases of valves specified as rheumatic	..	..	..	..	..	
	(*b*) 414	Other endocarditis specified as rheumatic	..	..	..	..	..	
	(*c*) 415	Other myocarditis specified as rheumatic	..	..	..	..	..	*See* A 82 (*b*)
	(*d*) 416	Other heart disease specified as rheumatic	..	..	..	..	..	
A 81		Arteriosclerotic and degenerative heart disease:—						
	(*a*) 420	Arteriosclerotic heart disease, including coronary disease	1	64	1	65	3	
	(*b*) 421	Chronic endocarditis not specified as rheumatic	8	245	48	253	4	
		Carried forward ..	2,407	14,273	1,318	16,680	2,755	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,407	14,273	1,318	16,680	2,755	
		VII.—*Diseases of the Circulatory System —contd.*						
A 81 (*c*)	422	Other myocardial degeneration ..	..	..	..	..	..	*See* A 82 (*b*)
A 82		Other diseases of heart:—						
(*a*)	430	Acute and subacute endocarditis ..	..	13	4	13	..	
(*b*)	431	Acute myocarditis	..	26	2	26	1	Comprises A 80 (*c*), A 81 (*c*), A 82 (*b*)
(*c*)	432	Pericarditis	..	7	2	7	..	
(*d*)	433	Functional disease of heart ..	3	23	3	26	2	
(*e*)	434	Other and unspecified diseases of heart	5	44	10	49	7	
A 83	440–443	Hypertension with heart disease ..	9	387	97	396	13	Comprises A 83 and A 84
A 84	444–447	Hypertension without mention of heart						
A 85		Diseases of arteries:—						
(*a*)	450	General arteriosclerosis	..	22	13	22	1	
(*b*)	451	Aortic aneurysm specified as non-syphilitic and dissecting aneurysm ..	..	..	..	..	..	
(*c*)	452	Other aneurysm, except of heart and aorta	..	..	..	..	..	
(*d*)	453	Peripheral vascular disease ..	..	..	..	..	..	
(*e*)	454	Arterial embolism and thrombosis ..	..	..	..	..	..	
(*f*)	455	Gangrene of unspecified cause ..	1	25	..	26	3	
		Carried forward ..	2,425	14,820	1,449	17,245	2,782	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,425	14,820	1,449	17,245	2,782	
		VII.—*Diseases of the Circulatory System —contd.*						
A 85 (*g*)	456	Other diseases of arteries ..	2	2	1	4	..	
A 86		Other diseases of circulatory system:—						
(*a*)	460,462	Varicose veins	..	36	..	36	..	
(*b*)	461	Haemorrhoids	6	321	..	327	10	
(*c*)	463–464	Phlebitis and thrombophlebitis ..	..	9	1	9	..	
(*d*)	465	Pulmonary embolism and infarction ..	..	..	..	..	..	
(*e*)	466	Other venous embolism and thrombosis	..	16	5	16	..	
(*f*)	467	Other diseases of circulatory system ..	..	30	..	30	..	
(*g*)	468	Adenitis, Lymphadenitis, and other diseases of lymph nodes and lymph channels	4	86	..	90	1	
		VIII.—*Diseases of the Respiratory System*						
A 87		Acute upper respiratory infections:—						
(*a*)	470	Acute nasopharyngitis (common cold)	..	107	..	107	1	
		Carried forward ..	2,437	15,427	1,456	17,864	2,794	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,437	15,427	1,456	17,864	2,794	
		VIII.—*Diseases of the Respiratory System —contd.*						
A 87 (*b*)	471	Acute sinusitis	..	123	..	123	..	
(*c*)	472	Acute pharyngitis	..	..	..	..	..	} *See* A 107 (*b*)
(*d*)	473	Acute tonsillitis	..	..	..	..	..	
(*e*)	474	Acute laryngitis and tracheitis ..	..	14	2	14	..	
(*f*)	475	Other acute upper respiratory infections	..	..	..	..	..	
A 88	480–483	Influenza	..	76	1	76	..	
A 89	490	Lobar Pneumonia	7	385	34	392	8	
A 90	491	Broncho-pneumonia	4	643	347	647	12	
A 91	492–493	Primary atypical, other and unspecified pneumonia	9	95	12	104	8	
A 92	500	Acute bronchitis	2	51	1	53	..	
A 93		Bronchitis, chronic and unqualified:—						
(*a*)	501	Bronchitis unqualified	..	176	1	176	4	
(*b*)	502	Chronic bronchitis	3	67	5	70	5	
A 94	510	Hypertrophy of tonsils and adenoids ..	..	..	..	..	..	
A 95		Empyema and Abscess of lung:—						
(*a*)	518	Empyema	2	42	8	44	2	
(*b*)	521	Abscess of lung	6	45	4	51	10	
A 96	519	Pleurisy	14	151	4	165	34	
		Carried forward ..	2,484	17,295	1,875	19,779	2,877	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,484	17,295	1,875	19,779	2,877	
		VIII.—*Diseases of the Respiratory System —contd.*						
A 97		All other respiratory diseases:—						
(*a*)	517	Other diseases of upper respiratory tract	..	..	..	..	..	
(*b*)	520	Spontaneous pneumothorax ..	..	..	..	..	..	
(*c*)	522	Pulmonary congestion and hypostasis	..	1	1	1	..	
(*d*)	525	Other chronic interstitial pneumonia ..	..	1	..	1	..	
(*e*)	523	Pneumoconiosis	..	..	..	..	..	
(*f*)	526	Bronchiectasis	12	97	6	109	6	
(*g*)	511–516 524 527	All other respiratory diseases ..	6	121	16	127	11	
		IX.—*Diseases of the Digestive System*						
A 98		Diseases of teeth and supporting structures:—						
(*a*)	530	Dental caries	..	8	..	8	..	
(*b*)	532.0	Gingivitis						
(*c*)	532.1 532.2	Pyorrhoea	1	62	..	63	1	Comprises A 98 (*b*) and (*c*)
		Carried forward ..	2,503	17,585	1,898	20,088	2,895	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡ Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,503	17,585	1,898	20,088	2,895	
		IX.—*Diseases of the Digestive System —contd.*						
A 98	(*d*)	531,533–535 Other diseases of teeth and supporting structures	..	..	..	..	..	
A 99		540 Ulcer of stomach	14	229	20	243	9	
A 100		541 Ulcer of duodenum	8	113	7	121	1	
A 101		543 Gastritis and duodenitis	8	131	..	139	1	
A 102		550–553 Appendicitis	9	853	9	862	13	
A 103		Intestinal obstruction and hernia:—						
	(*a*)	560 Hernia of abdominal cavity without mention of obstruction ..	8	391	3	399	8	
	(*b*)	561 Hernia of abdominal cavity with obstruction	..	89	9	89	..	
	(*c*)	570.0 Intussusception	1	58	23	59	..	
	(*d*)	570.3 Volvulus	..	..	..	..	..	
	(*e*)	570.1,570.2 570.4,570.5 } Other intestinal obstruction ..	..	..	..	..	..	
A 104		Gastro-enteritis and colitis, except diarrhoea of the new born:—						
	(*a*)	571.0 Gastro-enteritis and colitis, ages between four weeks and two years..	14	1,229	425	1,243	20	Includes A 132 (*a*)
		Carried forward ..	2,565	20,678	2,394	23,243	2,947	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡ Total cases treated	§ Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,565	20,678	2,394	23,243	2,947	
		IX.—*Diseases of the Digestive System —contd.*						
A 104 (*b*)	571.1	Gastro-enteritis and colitis, ages two years and over	3	353	81	356	5	Includes A 104 (*c*)
(*c*)	572	Chronic enteritis and ulcerative colitis	..	..	..	..	..	*See* A 104 (*b*)
A 105		Cirrhosis of liver:—						
(*a*)	581.0	Cirrhosis of liver without mention of alcoholism	2	117	15	119	7	
(*b*)	581.1	Cirrhosis of liver with alcoholism ..	..	6	2	6	..	
A 106		Cholelithiasis and Cholecystitis:—						
(*a*)	584	Cholelithiasis	..	47	8	47	1	
(*b*)	585	Cholecystitis without mention of calculi	6	80	3	86	5	
A 107		Other diseases of Digestive System:—						
(*a*)	536	Stomatitis	..	23	1	23	1	
(*b*)	538	Other diseases of buccal cavity ..	4	1,003	6	1,007	12	Includes A 87 (*c*) and (*d*)
(*c*)	539.0	Functional disorders of oesophagus ..	..	64	8	64	2	Comprises A 107 (*c*) and (*d*)
(*d*)	539.1	Stricture or obstruction of oesophagus						
(*e*)	544	Disorders of function of stomach ..						
(*f*)	545	Other diseases of stomach and duodenum	5	162	10	167	10	Comprises A 107 (*e*) and (*f*)
		Carried forward ..	2,585	22,533	2,528	25,118	2,990	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡ Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,585	22,533	2,528	25,118	2,990	
		IX.—*Diseases of the Digestive System —contd.*						
A 107	(*g*)	573.0 Constipation	..	24	..	24	..	
	(*h*)	573 except 573.0 Other functional disorders of intestines	..	..	..	..	..	*See* A 107 (*l*)
	(*i*)	574 Anal fissure and fistula	1	117	..	118	1	Comprises A 107 (*d*) and (*j*)
	(*j*)	575 Abscess of anal and rectal regions ..						
	(*k*)	576 Peritonitis	1	51	18	52	..	
	(*l*)	578 Other diseases of intestines and peritoneum	1	258	..	259	1	Includes A 107 (*h*), (*l*)
	(*m*)	580 Acute yellow atrophy of liver ..	2	38	21	40	3	
	(*n*)	583 Other diseases of liver	7	187	23	194	5	
	(*o*)	586 Other diseases of gall-bladder and biliary ducts	7	3	1	10	..	
	(*p*)	587 Diseases of pancreas	..	18	4	18	..	
	(*q*)	537,542 577,582 Other diseases of digestive system ..	..	..	..	..	..	
		Carried forward ..	2,604	23,229	2,595	25,833	3,000	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,604	23,229	2,595	25,833	3,000	
		X.—*Diseases of the Genito-Urinary System*						
A 108	590	Acute nephritis	13	179	12	192	4	
A 109		Chronic, other and unspecified nephritis:—						
(*a*)	591	Nephritis with oedema, including nephrosis	..	..	..	..	..	*See* A 109 (*c*)
(*b*)	592	Chronic nephritis	3	125	37	128	8	
(*c*)	593	Nephritis not specified as acute or chronic	10	40	16	50	2	Includes A 109 (*a*), (*c*)
(*d*)	594	Other renal sclerosis	..	..	..	..	..	
A 110	600	Infections of kidney	4	235	10	239	8	
A 111		Calculi of urinary system:—						
(*a*)	602	Calculi of kidney and ureter ..	4	230	4	234	2	
(*b*)	604	Calculi of other parts of urinary system	2	23	..	25	1	
A 112	610	Hyperplasia of prostate	..	..	..	..	..	*See* A 114 (*f*)
A 113	620–621	Diseases of breast	..	37	..	37	..	
A 114		Other diseases of genito-urinary system:—						
(*a*)	603	Other diseases of kidney and ureter ..	..	..	..	..	..	
(*b*)	605	Cystitis	..	32	3	32	1	
(*c*)	606	Other diseases of bladder ..	..	3	..	3	..	
(*d*)	608	Stricture of urethra	2	33	..	35	1	
(*e*)	609	Other diseases of urethra ..	1	57	..	58	..	
(*f*)	612	Other diseases of prostate ..	3	47	3	50	3	Includes A 112, A 114 (*f*)
(*g*)	613	Hydrocele	3	220	..	223	3	
		Carried forward ..	2,649	24,490	2,680	27,139	3,033	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,649	24,490	2,680	27,139	3,033	
		X.—*Diseases of the Genito-Urinary System —contd.*						
A 114 (*h*)	614	Orchitis and epididymitis ..	3	66	..	69	4	
(*i*)	611, 615–617	Other diseases of male genital organs ..	5	110	..	115	1	
(*j*)	622–624	Salpingitis and oophoritis ..	..	..	..	..	..	
(*k*)	625	Other diseases of ovary and Fallopian tube	3	80	2	83	1	
(*l*)	626	Diseases of parametrium and pelviperitoneum (female)	..	6	..	6	..	
(*m*)	630	Infective disease of uterus, vagina and vulva	8	729	13	737	9	Comprises A 114 (*m*) and (*n*)
(*n*)	631–633	Other diseases of uterus						
(*o*)	634	Disorders of menstruation ..	7	270	5	277	5	Comprises A 114 (*o*) and (*p*)
(*p*)	635–637	Other diseases of female genital organs						
(*q*)	601, 607	All other diseases of the genito-urinary system	..	..	..	..	..	
		Carried forward ..	2,675	25,751	2,700	28,426	3,053	

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡ Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,675	25,751	2,700	28,426	3,053	
		XI.—*Deliveries and Complications of Pregnancy Childbirth and the Puerperium*						
A 115		Sepsis of pregnancy, childbirth and the puerperium:—						
(*a*)	640	Pyelitis and pyelonephritis of pregnancy	..	1	..	1	..	
(*b*)	641	Other infections of genito-urinary tract during pregnancy	..	..	..	..	..	
(*c*)	681	Sepsis of childbirth and the puerperium	7	56	3	63	2	
(*d*)	682	Puerperal phlebitis and thrombosis ..	..	..	..	..	..	
(*e*)	684	Puerperal pulmonary embolism ..	..	..	..	..	..	
A 116		Toxaemias of pregnancy and the puerperium:—						
(*a*)	642.2	Albuminuria of pregnancy	..	..	..	..	..	
(*b*)	642.3	Eclampsia of pregnancy	..	..	..	..	..	*See* A 116 (*g*)
(*c*)	642.4	Hyperemesis gravidarum ..	..	68	..	68	..	
(*d*)	642.5	Acute yellow atrophy of liver ..	..	..	..	..	..	
(*e*)	642.5	Other toxaemias of pregnancy ..	..	822	3	822	..	
(*f*)	652	Abortion with toxaemia, without mention of sepsis	..	..	..	..	..	
(*g*)	685	Puerperal eclampsia	..	1	1	1	..	Includes A 116 (*b*), (*g*)
(*h*)	686	Other forms of puerperal toxaemia ..	..	..	..	..	..	
A 117		Haemorrhage of pregnancy and childbirth:—						
(*a*)	643	Placenta praevia	..	117	..	117	..	
		Carried forward ..	2,682	26,816	2,707	29,498	3,055	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,682	26,816	2,707	29,498	3,055	
		XI.—*Deliveries and Complications of Pregnancy Childbirth and the Puerperium —contd.*						
A 117 (*b*)	644	Other haemorrhage of pregnancy ..	..	88	1	88	..	
(*c*)	670	Delivery complicated by placenta praevia or antepartum haemorrhage ..	..	..	..	..	..	
(*d*)	671	Delivery complicated by retained placenta	..	..	..	..	..	
(*e*)	672	Delivery complicated by other postpartum haemorrhage	..	..	..	..	..	
A 118	650	Abortion without mention of sepsis or toxaemia	9	1,248	..	1,257	6	
A 119	651	Abortion with sepsis	2	10	1	12	..	
A 120		Other complications of pregnancy, childbirth and the puerperium:—						
(*a*)	645	Ectopic pregnancy	2	83	..	85	1	
(*b*)	646	Anaemia of pregnancy	5	125	..	130	3	
(*c*)	683	Pyrexia of unknown origin during the puerperium	..	..	..	..	..	
(*d*)	688.1	Puerperal psychoses	..	..	..	..	..	
(*e*)	689	Mastitis and other disorders of lactation	..	..	..	..	..	
		Carried forward ..	2,700	28,370	2,709	31,070	3,065	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,700	28,370	2,709	31,070	3,065	
		XI.—*Deliveries and Complications of Pregnancy Childbirth and Puerperium—contd.*						
A 120 (*f*)	647–649 673–680 687 688.0 688.2–688.3	Other complications of pregnancy, childbirth and the puerperium ..	4	2,259	21	2,263	10	
(*g*)	660	Delivery without complications ..	200	13,467	..	13,667	205	
		XII.—*Diseases of the Skin and Cellular Tissue*						
A 121		Infections of skin and subcutaneous tissue:—						
(*a*)	690	Boil and carbuncle	..	77	3	77	3	
(*b*)	691–693	Cellulitis and abscess	15	534	5	549	19	
(*c*)	694–698	Other infections of skin and subcutaneous tissue	..	7	..	7	..	
		Carried forward ..	2,919	44,714	2,738	47,633	3,302	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,919	44,714	2,738	47,633	3,302	
		XIII.—*Diseases of the Bones and Organs of Movement*						
A 122		Arthritis and spondylitis:—						
	(*a*) 720	Acute arthritis due to pyogenic organisms	..	..	..	..	..	
	(*b*) 721	Acute nonpyogenic arthritis ..	..	..	..	..	..	
	(*c*) 722	Rheumatoid arthritis and allied conditions	8	173	..	181	12	
	(*d*) 723–725	Arthritis specified and unspecified ..	..	..	..	..	..	
A 123		Muscular rheumatism and rheumatism, unspecified:—						
	(*a*) 726	Muscular rheumatism	..	..	..	..	..	
	(*b*) 727	Rheumatism unspecified ..	..	..	..	..	..	
A 124	730	Osteomyelitis and periostitis ..	4	88	1	92	9	
A 125		Ankylosis and acquired musculoskeletal deformities:—						
	(*a*) 737	Ankylosis of joint	..	..	..	..	..	
	(*b*) 745–749	Other acquired musculoskeletal deformities	..	..	..	..	..	
A 126		All other diseases of skin and musculoskeletal system:—						
	(*a*) 715	Chronic ulcer of skin (including tropical ulcer)	7	103	4	110	5	
		Carried forward ..	2,938	45,078	2,743	48,016	3,328	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,938	45,078	2,743	48,016	3,328	
		XIII.—*Diseases of the Bones and Organs of Movement—contd.*						
A 126 (*b*)	700–714 716	All other diseases of skin ..	14	400	2	414	21	
(*c*)	731–736 738–744	All other diseases of musculoskeletal system	5	96	..	101	5	
		XIV.—*Congenital Malformations*						
A 127	751	Spina bifida and meningocele ..	..	26	1	26	..	
A 128	754	Congenital malformations of circulatory system	..	40	23	40	4	
A 129		All other congenital malformations:—						
(*a*)	750	Monstrosity	..	1	..	1	..	
(*b*)	752	Congenital hydrocephalus ..	..	9	5	9	1	
(*c*)	753	Other congenital malformations of nervous system and sense organs ..	..	..	..	..	..	*See* A 129 (*j*)
(*d*)	755	Cleft palate and harelip	..	100	..	100	1	
		Carried forward ..	2,957	45,750	2,774	48,707	3,360	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,957	45,750	2,774	48,707	3,360	
		XIV.—*Congential Malformations—contd.*						
A 129 (*e*)	756.0	Congenital hypertrophic pyloric stenosis	..	5	1	5	..	
(*f*)	756.1	Imperforate anus	..	13	7	13	1	
(*g*)	756.2	Other congenital malformations of digestive system	..	..	..	..	..	
(*h*)	757	Congenital malformations of genito-urinary system	..	..	..	..	..	} *See* A 129 (*j*)
(*i*)	758	Congenital malformations of bone and joint	..	..	..	..	..	
(*j*)	759	Other and unspecified congenital malformations, not elsewhere classified	..	42	12	42	..	Includes A 129 (*c*), (*h*), (*i*), (*j*)
		XV.—*Certain Diseases of Early Infancy*						
A 130		Birth injuries:—						
(*a*)	760	Intracranial and spinal injury at birth..	..	..	..	..	..	
(*b*)	761	Other birth injury	..	..	..	..	..	
		Carried forward ..	2,957	45,810	2,794	48,767	3,361	

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§ Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,957	45,810	2,794	48,767	3,361	
		XV.—*Certain Diseases of Early Infancy —contd.*						
A 131	762	Post-natal asphyxia and atelectasis ..	..	3	1	3	..	
A 132		Infections of the newborn:—						
(*a*)	764	Diarrhoea of newborn	..	..	..	..	..	*See* A 104 (*a*)
(*b*)	765	Ophthalmia neonatorum ..	..	..	..	..	..	
(*c*)	763	Pneumonia of newborn	..	..	..	..	..	
(*d*)	766	Pemphigus neonatorum	..	3	..	3	..	
(*e*)	767	Umbilical sepsis	..	15	6	15	..	
(*f*)	768	Other sepsis of newborn ..	..	..	..	..	..	
A 133	770	Haemolytic disease of newborn ..	..	10	10	10	..	
A 134	769	All other defined diseases of early infancy	..	..	..	..	..	*See* A 135 (*c*)
	771–772							
A 135		Ill-defined diseases peculiar to early infancy, and immaturity unqualified:—						
(*a*)	773	Congenital debility	2	16	9	18	..	
(*b*)	774	Premature birth	..	35	23	35	1	
(*c*)	775–776	Other ill-defined diseases peculiar to early infancy and immaturity unqualified	..	12	5	12	..	Includes A 134, A 135 (*c*)
		Carried forward ..	2,959	45,904	2,848	48,863	3,362	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	2,959	45,904	2,848	48,863	3,362	
		XVI.—*Symptoms, Senility and Ill-Defined Conditions*						
A 136	794	Senility without mention of psychoses	2	18	7	20	..	
A 137		Ill-defined and unknown causes of morbidity and mortality:—						
(*a*)	780	Infantile convulsions	..	25	1	25	..	
(*b*)	788.8	Pyrexia of unknown origin ..	..	..	..	..	..	
(*c*)	793	Observation, without need for further medical care	12	401	..	413	12	
(*d*)	795.1	Malingering	..	26	..	26	..	
(*e*)	795.2	Sudden illness (cause unknown) ..	..	4	..	4	..	
(*f*)	795.3	Found dead (cause unknown) ..	..	..	..	..	..	
(*g*)	795.0 795.4 795.5	Other ill-defined and unknown causes of morbidity and mortality ..	87	1,467	59	1,554	87	
		Carried forward ..	3,060	47,845	2,915	50,905	3,461	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	3,060	47,845	2,915	50,905	3,461	
		XVII.—*Accidents, Poisonings and Violence*						
		'E' Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)						
AE 138	E810–E835	Motor vehicle accidents	24	638	70	662	19	
AE 139		Other Transport Accidents:—						
(*a*)	E800–E802	Railway accidents	..	8	..	8	..	
(*b*)	E850–E858	Water transport accidents ..	..	..	..	..	..	} *See* AE 139 (*d*)
(*c*)	E860–E866	Aircraft accidents	..	..	..	..	..	
(*d*)	E840–E845	Other transport accidents ..	39	624	27	663	39	Includes AE 139 (*b*), (*c*), (*d*)
AE 140		Accidental poisoning:—						
(*a*)	E870	Accidental poisoning by morphia and other opium derivatives ..	..	..	..	..	..	
(*b*)	E874	Accidental poisoning by other analgesic and soporific drugs	..	..	..	..	..	
(*c*)	E878	Accidental poisoning by other and unspecified drugs	..	..	..	..	..	
(*d*)	E883	Accidental poisoning by corrosive aromatics, acids and caustic alkalies	..	..	..	..	..	
		Carried forward ..	3,123	49,115	3,012	52,238	3,519	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	3,123	49,115	3,012	52,238	3,519	
		XVII.—*Accidents, Poisonings and Violence —contd.*						
		'E' Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)—contd.						
AE 140 (*e*)	E884	Accidental poisoning by mercury and its compounds	..	..	..	..	..	
(*f*)	E885	Accidental poisoning by lead and its compounds	..	4	..	4	1	
(*g*)	E886	Accidental poisoning by arsenic and antimony and their compounds ..	..	1	..	1	..	
(*h*)	E888	Accidental poisoning by other and unspecified solid or liquid substances ..	..	3	..	3	..	
(*i*)	E890–E895	Accidental poisoning by gases and vapours	..	11	..	11	..	
(*j*)	E871–E873 E875–E877 E879–E882 E887	Other accidental poisoning ..	..	84	1	84	2	
AE 141	E900–E904	Accidental falls	30	913	55	943	27	
AE 142	E912	Accident caused by machinery ..	..	48	1	48	..	
AE 143	E916	Accident caused by fire and explosion of combustible material ..	1	116	1	117	9	
AE 144	E917–E918	Accident caused by hot substance, corrosive liquid, steam and radiation ..	6	205	6	211	8	
		Carried forward ..	3,160	50,500	3,076	53,660	3,566	

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	3,160	50,500	3,076	53,660	3,566	
		XVII.—*Accidents, Poisonings and Violence —contd.*						
		'E' Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)—cond.						
AE 145	E919	Accident caused by firearms ..	1	1	..	2	..	
AE 146	E929	Accidental drowning and submersion ..	..	8	..	8	..	
AE 147		All other accidental causes:—						
(*a*)	E920	Foreign body entering eye and adnexa	..	..	..	..	..	
(*b*)	E923	Foreign body entering other orifice ..	..	..	..	..	..	
(*c*)	E927	Accidents caused by bites and stings of venomous animals and insects ..	1	33	1	34	..	*See* AE 147 (*s*)
(*d*)	E928	Other accidents caused by animals ..	1	24	..	25	..	
(*e*)	E913	Accidents caused by cutting or piercing instruments	1	82	..	83	..	
(*f*)	E914	Accidents caused by electric current ..	..	2	..	2	..	
(*g*)	E925	Accidental mechanical suffocation ..	..	..	..	..	..	
(*h*)	E926	Lack of care of infants under one year of age	..	..	..	..	..	
(*i*)	E931	Excessive heat	..	8	..	8	..	
(*j*)	E932	Excessive cold	..	..	..	..	..	
		Carried forward ..	3,164	50,658	3,077	53,822	3,566	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	3,164	50,658	3,077	53,822	3,566	
		XVII.—*Accidents, Poisonings and Violence —contd.*						
		'E' Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)—contd.						
AE 147 (*k*)	E933	Hunger, thirst and exposure ..	..	..	..	..	..	
(*l*)	E934	Cataclysm	..	..	..	..	..	
(*m*)	E935	Lightning	..	1	1	1	..	
(*n*)	E936	Other and unspecified accidents ..	..	17	2	17	..	
(*o*)	E940, E941	Vaccinia including post-vaccinal encephalitis	..	2	..	2	..	
(*p*)	E942	Other complications of small-pox vaccination	..	3	..	3	..	
(*q*)	E954	Anaesthetic accidents	..	..	..	..	..	
(*r*)	E950–E953, E955–E959	Accidents due to medical or surgical intervention	..	..	..	..	..	
(*s*)	E910–E911, E915, E921–E922, E924–E930, E943–E946, E960–E962	All other accidental causes ..	..	73	..	73	1	Includes AE 147 (*b*), (*s*)
		Carried forward ..	3,164	50,754	3,080	53,918	3,567	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	3,164	50,754	3,080	53,918	3,567	
		XVII.—*Accidents, Poisonings and Violence —contd.*						
		'E' Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)—contd.						
AE 148		Suicide and self-inflicted injury:—						
(*a*)	E970	Suicide and self-inflicted injury by analgesic and soporific substances ..	6	125	40	131	9	Comprises AE 481 (*a*) and (*b*)
(*b*)	E971	Suicide and self-inflicted injury by other solid and liquid substances ..						
(*c*)	E972	Suicide and self-inflicted injury by gases in domestic use	..	..	..	..	..	
(*d*)	E973	Suicide and self-inflicted injury by other gases	..	..	..	..	..	
(*e*)	E974	Suicide and self-inflicted injury by hanging or strangulation ..	..	4	..	4	..	
(*f*)	E975	Suicide and self-inflicted injury by submersion (drowning) ..	..	10	1	10	..	
(*g*)	E976	Suicide and self-inflicted injury by firearms and explosives ..	..	..	..	..	..	
(*h*)	E977	Suicide and self-inflicted injury by cutting or piercing instruments ..	..	8	1	8	..	
		Carried forward ..	3,170	50,901	3,122	54,071	3,576	

APPENDIX *IV—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1952—*continued*

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§ Remaining at end of 1952	Remarks
				Admissions	Deaths			
		Brought forward ..	3,170	50,901	3,122	54,071	3,576	
		XVII.—*Accidents, Poisonings and Violence —contd.*						
		'E' Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)—contd.						
AE 148	(*i*) E978	Suicide and self-inflicted injury by jumping from high places ..	..	2	..	2	..	
	(*j*) E963–E979	Suicide and self-inflicted injury by other and unspecified means ..	..	..	..	..	..	
AE 149		Homicide and injury purposely inflicted by other persons (not in war):—						
	(*a*) E980	Non-accidental poisoning by another person	..	..	..	..	..	
	(*b*) E981	Assault by firearms and explosives ..	1	7	..	8	1	
	(*c*) E982	Assault by cutting or piercing instruments	1	89	4	90	1	
	(*d*) E964–E983	Assault by other means	2	205	7	207	3	
	(*e*) E984	Injury to intervention of police ..	..	..	..	..	..	
	(*f*) E985	Execution (legal)	..	..	..	..	..	
	(*g*)	Infanticide	..	..	..	..	..	
AE 150	E990–E999 E965	Injury resulting from operations of war	..	..	..	..	..	
		Grand Total ..	3,174	51,204	3,133	54,378	3,581	

APPENDIX *IV—continued*

RETURN OF HOSPITAL IN-PATIENTS BY RACE FOR THE YEAR 1952

Race	†Remaining at end of 1951	YEARLY TOTAL		‡Total cases treated	§Remaining at end of 1952	Remarks
		Admissions	Deaths			
Europeans	25	1,449	25	1,474	39	
Eurasians	37	1,004	32	1,041	48	
Chinese	2,550	37,549	2,674	40,099	2,860	
Indians	348	7,901	278	8,249	371	
Malays	204	2,746	112	2,950	248	
Javanese	1	151	9	152	3	
Japanese	..	8	..	8	2	
Others	9	431	3	440	12	
	3,174	51,239	3,133	54,413	3,583	
Less healthy persons admitted to hospital to accompany children or friends	..	35	..	35	2	
GRAND TOTAL ..	3,174	51,204	3,133	54,378	3,581	

APPENDIX V

TABLE SHOWING MAIN CAUSES OF MORBIDITY OF IN-PATIENTS IN THE GENERAL HOSPITAL FOR THE YEARS 1952 AND 1951

Causes of Death	1952		1951	
	Admissions	Deaths	Admissions	Deaths
Enteric Group	133	4	78	9
Typhus	41	..	27	..
Malaria	143	7	192	15
Diphtheria	15	2	12	3
Influenza	49	1	47	..
Dysentry, Diarrhoea and Enteritis	1,562	504	937	370
Leprosy	1	..	2	..
Tuberculosis Respiratory System	560	112	621	117
Other Tuberculosis Diseases ..	492	171	460	198
Cancer	895	167	666	138
Beri Beri	33	10	38	13
Cerebral Haemorrhage ..	222	62	200	52
Diabetes	206	7	206	7
Bronchitis	253	6	275	8
Pneumonia all forms ..	1,067	386	787	289
Other Respiratory Diseases ..	793	35	448	35
Ulcer of Stomach, Duodenum, etc.	332	26	299	15
Ankylostomiasis	62	1	57	1
Other Intestinal Parasites ..	126	3	136	9
Appendicitis	837	8	754	13
Cirrhosis of Liver	116	14	128	21
Acute and Chronic Nephritis ..	325	57	256	41
Venereal Affections	101	20	98	18
Congenital Debility, Malnutrition, Premature Birth, etc. ..	51	32	139	71
Suicidal	147	41	132	32
Other forms of Violence ..	3,103	174	3,196	207
Other Diseases	11,088	749	9,529	664
Total ..	22,753	2,599	19,720	2,346

APPENDIX *VI*

RETURN OF SPECIMENS EXAMINED IN THE CLINICAL LABORATORY FROM JANUARY TO 31ST DECEMBER, 1952

EXAMINATION OF BLOOD—PHYSIOLOGICAL		
Leucocyte Count	17,672	
Differential Leucocyte Count	17,233	
Erythrocyte Count	14,251	
Estimation for Hæmoglobin	14,331	
Blood Picture	390	
Blood Picture Myeloid Leukæmia	59	
Blood Picture Lymphoid Leukæmia	27	
Blood Sedimentation Rate	7,383	
Packed Cell Volume	298	
Reticulocyte Count	365	
Thrombocyte Count	331	
Bleeding Time	310	
Clotting Time	559	
Prothrombin Time	394	
Eosinophil Count	262	
Size of R.B.C. (Average)	45	
Parasite Count	48	
Colour Index	70	
Fragility of R.B.C.	29	
Mean Corpuscular Volume and Mean Corpuscular Hæmoglobin Content	11	
	———	74,068
EXAMINATION OF BLOOD—BIOCHEMICAL		
Blood Urea	2,394	
Blood Sugar	2,417	
Blood Cholestrol	166	
Blood Calcium	132	
Blood Phosphate	54	
Blood Protein	862	
Blood Icteric Index	913	
Blood Vanden Bergh Reaction	913	
Blood Takata ara Test—Negative	255	
Positive	253	
Blood Uric Acid	42	
Blood Chlorides	11	
Blood Creatine	4	
Blood Creatinine	4	
Blood Alkaline Reserve	2	
Fouchet's Test	1	
Formalgel Test—Negative	17	
Positive	2	
	———	8,442
EXAMINATION OF URINE—BIOCHEMICAL		
Urea Clearance Test (184 cases)	368	
Urea Concentration Test (66 cases)	238	
Urine Sugar Estimation	15	
Urinary Diatase	31	
Urinary Chlorides	24	
Urine Bence Jones Protein	3	
Urine Addis Count	1	
Urine Creatine	5	
Urine Creatinine	5	
Urine Uric Acid	1	
Urine Albumen Estimation	1	
Urine Spectroscopic Examination	8	
Urine Glucosazone	1	
Urine Phenol	3	
	———	704
Carried forward ...		83,214

APPENDIX *VI—continued*

Brought forward ...			83,214
EXAMINATION OF URINE—ROUTINE			
Microscopic Examination and Albumen ...		40,920	
Chemical Examination for Bile, Urobilin, etc. ...		4,592	
24-Hours specimen for T.B.—Negative ...		21	
Micro-Filaria—Negative		9	
Positive		6	
			45,548
EXAMINATION OF CEREBRO-SPINAL FLUID			
Routine Examination:—			
1. Cell Count		2,720	
2. Total Protein			
3. Globulin			
4. Sugar (Qualitative)			
5. Total Chlorides			
6. Cytology and Smears for Organisms ...			
Sugar Estimation		300	
Clot for Tubercle Bacilli—Negative ...		316	
Positive ...		38	
Smear for Org.—Gram Neg. Bacilli ...		11	
Meningococci		6	
Pneumococci		7	
			3,398
EXAMINATION OF CISTERNAL FLUID			
Routine Examination (Same as C.S.F.) ...		6	
Sternal Smear—Myelogram		7	
L.D. Bodies Negative ...		2	
			15
EXAMINATION OF BODY FLUIDS			
Pleural Fluid		525	
Abdominal Fluid		234	
Other body Fluids		207	
Hydrocele Fluid for Micro-Filaria—Negative ...		3	
Positive ...		3	
			972
EXAMINATION OF GASTRIC CONTENTS			
Fractional Test Meal—648 cases			3,183
Basal Metabolic Rate No. of Cases ... 835			
Electrocardiogram No. of Cases ... 1,209			
EXAMINATION OF BLOOD FILMS			
Malarial Parasites—Negative			14,321
Subtertian		305	
Benigntertian		120	
Quartan		8	
Mixed Infection ...		2	
			435
Micro-Filaria—Negative		888	
Positive		58	
			946
Punctate Basophilia—Negative		29	
Positive		10	
			39
EXAMINATION OF SMEARS			
Prostatic Smear for G.C.—Negative ...		225	
Positive ...		4	
Urethral Smear for G.C.—Negative ...		63	
Positive ...		6	
Vaginal Smear for G.C.—Negative ...		43	
Positive ...		4	
			345
Carried forward ...			152,416

APPENDIX *VI—continued*

Brought forward ...		152,416
Cervical Smear for G.C.—Negative ...	32	
Positive ...	2	
Eye Smear for G.C.—Negative ...	27	
Positive ...	3	
Eye Smear for Other Organisms—Positive ...	9	
Throat and Nasal Smears for KLB—Positive ...	20	
TB—Positive ...	1	
Other Organisms	560	
		654
EXAMINATION OF SKIN SCRAPINGS		
Ear Clip, etc. for L.B.—Negative	186	
Positive	53	
Fungi—Negative	41	
Positive	16	
Scabies parasites—Negative	7	
Miscellaneous	327	
		630
EXAMINATION OF SPUTA		
Tubercle Bacilli—Negative		11,095
Positive	625	
Other Organisms	312	
		937
		165,732
EXAMINATION OF STOOLS		
Ova—Negative		16,410
Ova—Ankylostoma	1,964	
Ova—Ascaris	2,034	
Ova—Trichuris Trichura	366	
Ova—Oxyuris Vermicularis	10	
Ova—Strongloides	2	
Ova—Clonorchis Sinensis	2	
Ova—Anky and Ascaris	590	
Ova—Anky and T. Trichura	198	
Ova—Ascaris and T. Trichura	259	
Ova—Anky, Ascaris and T. Trichura ...	119	
Ova—Anky and Oxyuris Vermicularis ...	3	
Ova—Ascaris and O. Vermicularis	2	
Ova—Anky, Ascaris and O. Vermicularis ...	1	
Ova—Hymenolepia Diminuta and Ascaris ...	3	
Larvæ—Strongyloides	4	
		5,557
Amœba—Negative		8,020
Entamœba Histolytica	68	
Entamœba Coli	5	
		73
Cysts—Entamœba Histolytica	1	
Entamœba Coli	5	
Giardia Lamblia	57	
		63
Trichomonas Hominis		36
Occult Blood—Negative	1,627	
Positive	2,370	
Tubercle Bacilli—Negative	35	
Positive	1	
Trypsin	2	
		4,035
		199,926

APPENDIX *VII*

OUT-PATIENTS

TOTAL ATTENDANCES AT THE OUT-PATIENTS CLINICS DURING THE YEAR 1952 WERE DISTRIBUTED AS FOLLOWS:

Hospitals	New Cases	Repetitions	Total Attendances
General Hospital	93,658	265,111	358,769
Kandang Kerbau Maternity Hospital	48,069	71,966	120,035
Tan Tock Seng Hospital	6,898	115,458	122,356
Social Hygiene	16,002	109,148	125,150
Static and Travelling Dispensaries	52,209	33,796	86,005
Police and Families	4,676	15,686	20,362
School clinics at North Canal Road, Paya Lebar and Tk. Kurau	12,197	18,368	30,565
Total ..	233,709	629,533	863,242

Excludes the Prisons and Maternity and Child Welfare Clinics.

APPENDIX *VIII*

RESEARCH

(*a*) *Radiological*

The Rœntgenolic Features of Eosinophilic Lung by Doctors J. W. Winchester, M.D., D.M.R., T. J. Danaraj, L.M.S. and F. Y. Khoo, M.B., B.S., F.A.C.R. (to be published).

Kartagena's Syndrome. New theories advanced as to ætiology by Dr. W. B. Young, M.B., B.M., B.CH., M.R.C.S., L.R.C.P., D.T.M., D.M.R. and Dr. Law.

Actinomycosis of spine. New radiological features described by Dr. W. B. Young, M.B., B.M., B.CH., M.R.C.S., L.R.C.P., D.T.M., D.M.R. (to be published).

Research on the Upper Cervical Spine by Dr. W. B. Young, M.B., B.M., B.CH., M.R.C.S., L.R.C.P., D.T.M., D.M.R., Dr. C. Subrahmanyam, L.M.S., Professor D. E. C. Mekie, M.B., CH.B., F.R.C.S., F.I.C.S. and Professor E. S. Monteiro, M.D., M.R.C.P., F.R.F.P.S., D.C.H. with special reference to dislocations of the atlas on the axis (to be published).

Investigations on the Effect of A.C.T.H. on the Eosinophilia in Eosinophilic Lung have just been begun by Dr. W. B. Young, M.B., B.M., B.CH., M.R.C.S., L.R.C.P., D.T.M., D.M.R. with the co-operation of Doctors E. Hanam, M.B., B.S. and H. G. T. Maycock, L.R.C.P., M.R.C.S., Diploma in Clinical Pathology.

(*b*) *Ophthalmic*

Dr. A. D. Williamson, M.B., CH.B., D.O.M.S., F.R.C.S.

An investigation into the use of pethidine as a basal anæsthetic for cataract operation.

An investigation into the clinical characteristics as seen by the slit-lamp of epidemic kerato conjunctivitis.

Throughout 1952, the clinical character and eliology of keramology has been closely studied.

Attention was also paid to trachoma from the point of view of incidence in school children where it is thought to vary from 6 per cent downwards according to various observers.

(*c*) *Medical*

Professor E. S. Monteiro, M.D., M.R.C.P., F.R.F.P.S., D.C.H.

The anæmias of Singapore—a survey of the incidence and type of anæmia commonly met with in Singapore and a study of their ætiology and treatment.

Cortisone and A.C.T.H. therapy of rheumatoid arthritis, rheumatic fever and other diseases. This is being pursued with great care in an attempt to clarify their role as therapeutic agents.

The use of isonicotinic acid hydrazide in pulmonary tuberculosis and other forms of tuberculosis alone and in combination with streptomycin and P.A.S.

Study of the pathology, radiology and symtomalogy of atlas-axis dislocation and displacements in conjunction with the Department of Surgery and the Department of Radiology.

Dr. R. J. Grove-White, M.D., M.R.C.P.

During 1951 out-patient treatment with streptomycin and P.A.S. was instituted. This was carried on into 1952 and the experiment was controlled by the Bacteriology Department of the University of Malaya who did culture tests for streptomycin resistance using the same methods of standards as that described by the Veterans' Administration report at the 9th Streptomycin Conference. Over 300 cases in the series were tested and it was found that resistance developed with the dosage used at Tan Tock Seng Hospital in 10 per cent of all cases. As the type of case treated was often most unpromising these figures can be regarded as satisfactory as no doubt whatever that the benefit accruing to the patient is very considerable. The course used at Tan Tock Seng Hospital totals 68 G. of streptomycin given in two biweekly injections of 2 G. each while at the same time 12 G. of P.A.S. are given orally in tablet form.

The use of isoniazid (nydrazid) riminfon.

Experimental work was carried out with tebacyl and isoniazid in addition to the more standard treatment with sulphone (D.D.S.) sulphetrone or thiasemicarbazone T.B. 1.

Professor J. H. Hale, M.D., CH.B.

Japanese Type B Encephalitis. This virus has been isolated from three fatal cases of encephalitis occurring in the Colony. In all cases the patients were under 10 years of age. Further investigation has revealed that race horses are also attacked by this virus although in general it is not a fatal disease in horses. It would appear that within six months of arrival in the country 90 per cent of horses have contracted either a subclinical or clinical infection. Investigations are proceeding to establish the extent of infection in the Colony and if possible the epidemiological conditions. Although the work is still at a very early stage it appears that infection with the virus is probably widespread but frank clinical cases of the disease presenting encephalitis symptoms are more uncommon.

(*d*) *Surgical*

Professor D. E. C. Mekie, M.B., CH.B., F.R.C.S., F.I.C.S.

Lesions of Atlas. Completed and accepted for publication.

Invivo solution of Renal Calculi.

Chemotherapy of malignant diseases.

Peripheral vascular diseases. Study of temperature reactions.

MAP OF SINGAPORE

JOHORE

JOHORE STRAIT

S. JOHORE

S. KRANJI

S. SELETAR

S. PUNGGOL

S. SERANGOON

S. BERIH

S. JURONG

STRAIT

MAIN

WOODLANDS

Naval Base

Sembawang Airfield

NEE SOON

Seletar Airfield

YIO CHU KANG

LIM CHU KANG

Tengah Airfield

BUKIT PANJANG

JURONG

BUKIT TIMAH

SERANGOON

P. Ubin

P. Tekong Besar

CHANGI

Changi Airfield

KG. BATAK

ULU BEDOK

SIGLAP

Kallang Airfield

HOLLAND ROAD

PASIR PANJANG

TUAS

TANJONG KLING

P. Samulun

P. Merlimau

P. Pesek

P. Seraya

P. Ayer Chawan

P. Ayer Merbau

P. Sakra

P. Bakau

Sultan Shoal

P. Brani

P. Blakang Mati

Outer Shoal Beacon

P. Ular

P. Bukum

P. Busing

P. Hantu

P. Bukum Kechil

P. Salu

P. Jong

P. Sudong

P. Sakeng

P. Sebarok

Middle Is.

P. Semakau

P. Pawai

Alligator Is.

P. Senang

Barn Is.

P. Satumu

Raffles Light House

P. Tekukor

P. Sakijang Pelepah

Lazarus Is.

P. Sakijang Bendera

15 St. John's Is.

Scale: 3 Miles to an Inch

Miles 1 0 1 2 3 4 5 Miles

Road

City Boundary

Anti-Malaria Works

Permanent

Temporary

Infant Welfare Centres

Hospitals

1. General Hospital
2. Tan Tock Seng Hospital
3. Middleton Hospital
4. Woodbridge Hospital
5. Trafalgar Home
6. Kandang Kerbau Hospital
7. Middle Road Hospital
8. Children's Orthopaedic Hospital
9. Govt. Medical Store-Silat Road
10. Naval Hospital
11. Army Hospital
12. R.A.F. Hospital
13. Youngberg's Memorial Hospital
14. St. Andrew's Mission Hospital
15. St. John's Island Quarantine Stn.